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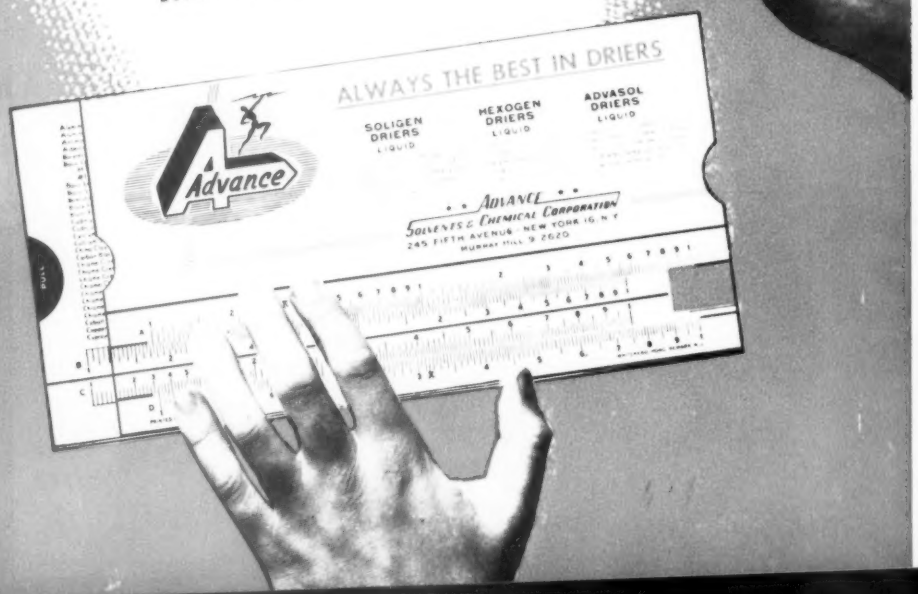

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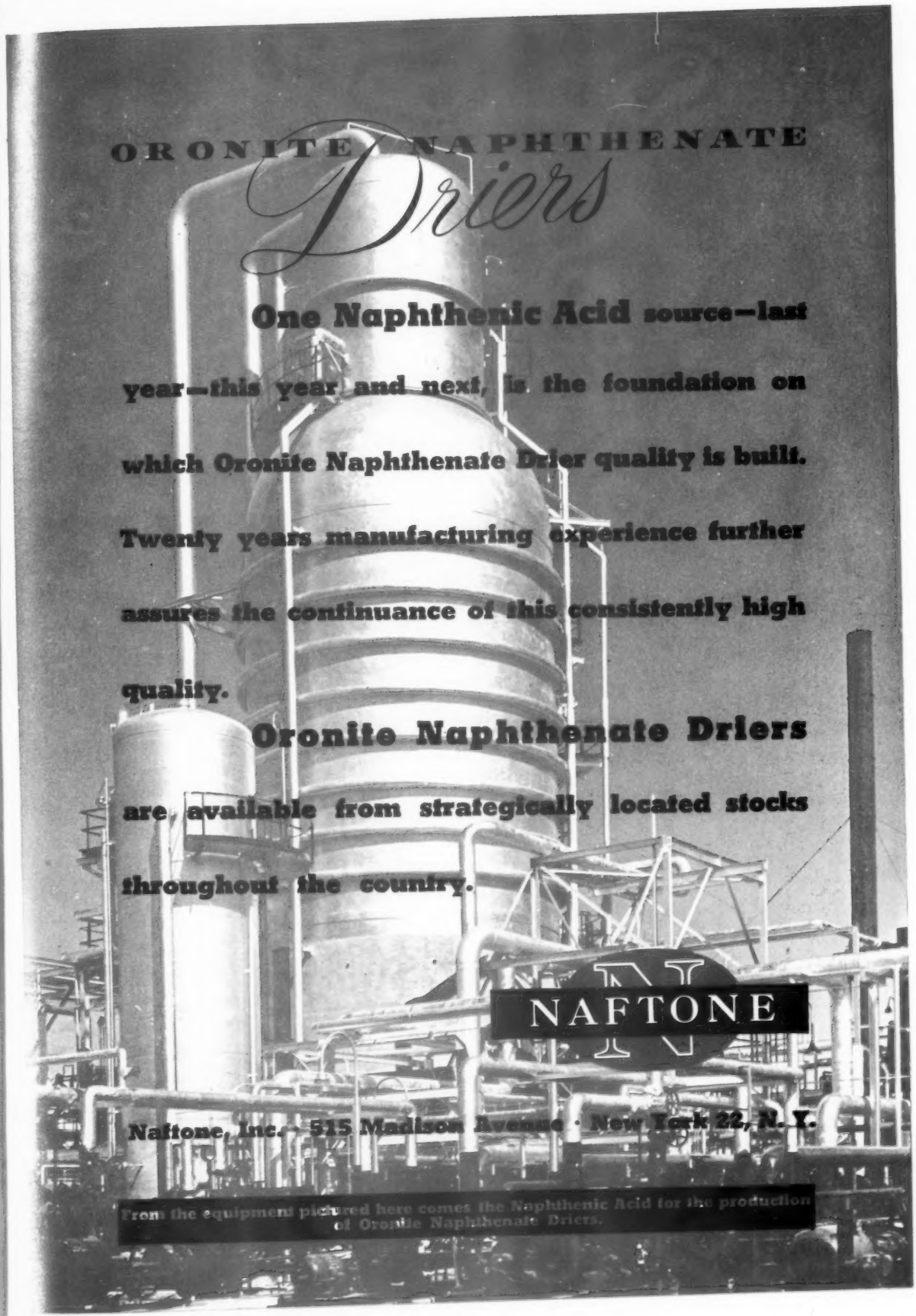
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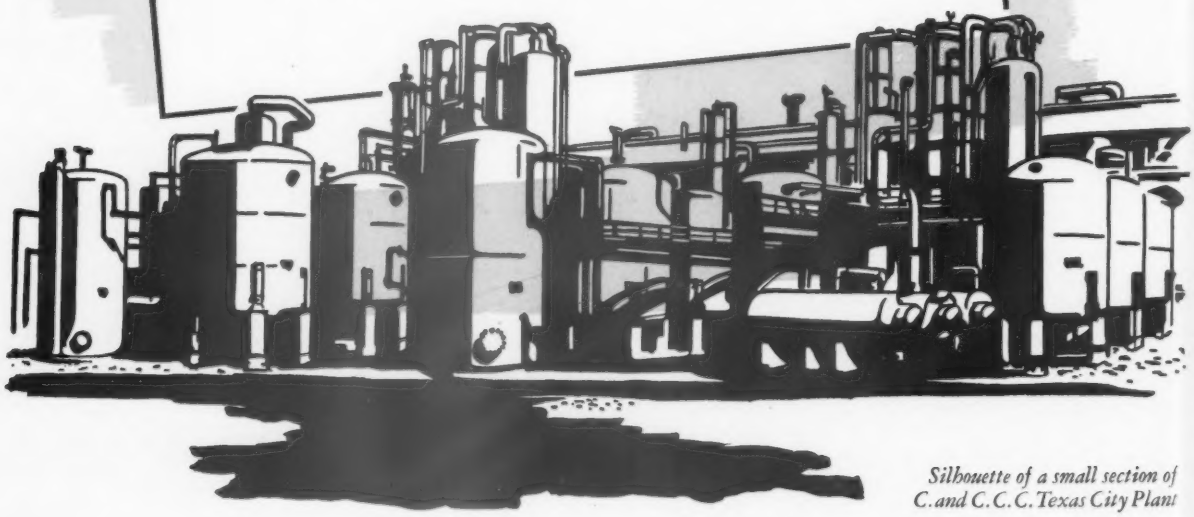

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(Established in 1910 as The Paint and Varnish Record)

VOL. 42 FEBRUARY, 1952 NO. 2

NEXT ISSUE

Observations on the Color Stability of Clear Lacquers is scheduled for the March issue. This paper describes some of the preliminary work carried out in developing test procedures for the evaluation of color stability in clear lacquer coatings and for studying the effect of resinous components in such lacquers.

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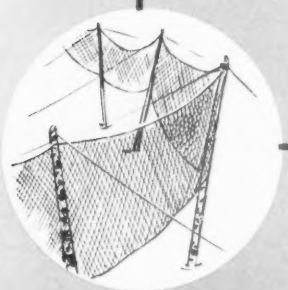

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Editorial Comment

Get In The Scrap

THE most serious problem confronting the defense production program today is the shortage of iron and steel scrap. The need of the steel mills and foundries of the nation for scrap, essential to the production of steel for national defense and civilian requirements, has become so critically urgent that no effort can be spared which will produce a pound of scrap. The importance of scrap to the success of the defense effort was well expressed by Manly Fleischmann, DPA-NPA Administrator, when he said, "The very success of our defense production program will depend upon our ability to solve the scrap problem."

The shortage of steel is intensified by the shortage of scrap necessary to the production of steel. Scrap comes from two sources, production scrap and purchased scrap. Production scrap is the trimmings, clippings, etc., that accumulates around the plant that works with metals, and purchased scrap comes from sources outside the industry. Dormant, heavy industrial scrap is what is needed now.

Scrap inventories are now below safe working levels. Some plants are operating with less than ten-day supply of scrap in sight. And winter weather always slows down the flow of scrap.

To achieve the goal of 36 million tons of scrap needed to reach the nation's steel production of 106 million ingot tons in 1951, and about 42 million tons of scrap needed to produce 118 million tons of steel in 1952, represents a challenge to the country, and demands a most agressive program to tap all the resources of dormant iron and steel scrap.

Paint manufacturers can do their bit in this drive by turning in old and obsolete mills, mixers, tank stands, old non-returnable drums, old exposed test panels, ground-down steel balls, and other equipment which has outlived its purpose and standing idle.

Put scrap collection on a "housekeeping" basis — Initiate a program to clean out the dormant scrap and to make a scrap survey every 30 days. Besides increasing the supply of scrap, continuous scrap recovery from questionable old stand-bys, obsolete machines and equipment reduces taxes through inventory write-off, improves safety conditions, gives lowered insurance rates and clears valuable space.

Have your salesmen look for scrap and see that it is returned by normal channels to the steel mills and foundries. Just think one ton of scrap will furnish the raw materials for 4 tons of steel. Remember that WHEREVER THERE IS BUSINESS THERE IS SCRAP!

Phthalic For The Future

A GOAL for expanding facilities for the production of phthalic anhydride to a total annual capacity of 367,700,000 pounds by the beginning of 1955 was recently announced by Ralph S. Trigg, Deputy Administrator of the Defense Production Administration for Program and Requirements.

This is an increase of 140 million pounds of capacity a year over the capacity available January 1, 1951, and is the amount determined as necessary to meet defense and essential civilian requirements. One of the important military uses is in rocket fuel.

Establishment of the expansion goal permits the DPA Office of Resources Expansion to consider applications for certificates permitting rapid tax amortization. These certificates permit a rapid write-off for tax purposes over a five-year period of all or a part of the cost of the new facilities. The normal period of all or a part of depreciation for tax purposes is considerably longer.

Available supplies of phthalic anhydride are not sufficient to meet demand, and an informal industry allocation is now in effect. Thirteen applications for certificates of necessity involving proposed phthalic production of 208 million pounds a year have been received.

Production of phthalic anhydride already has started at one of the installations included in the program. The chief problem in realizing production from the contemplated expansions will be the timing of the supply of raw materials, naphthalene or orthoxylene, but indications are that sufficient raw materials will be available.

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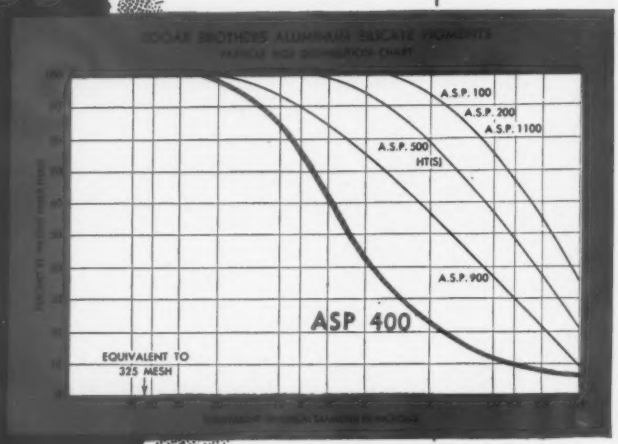

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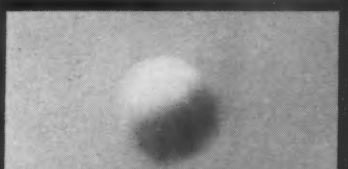

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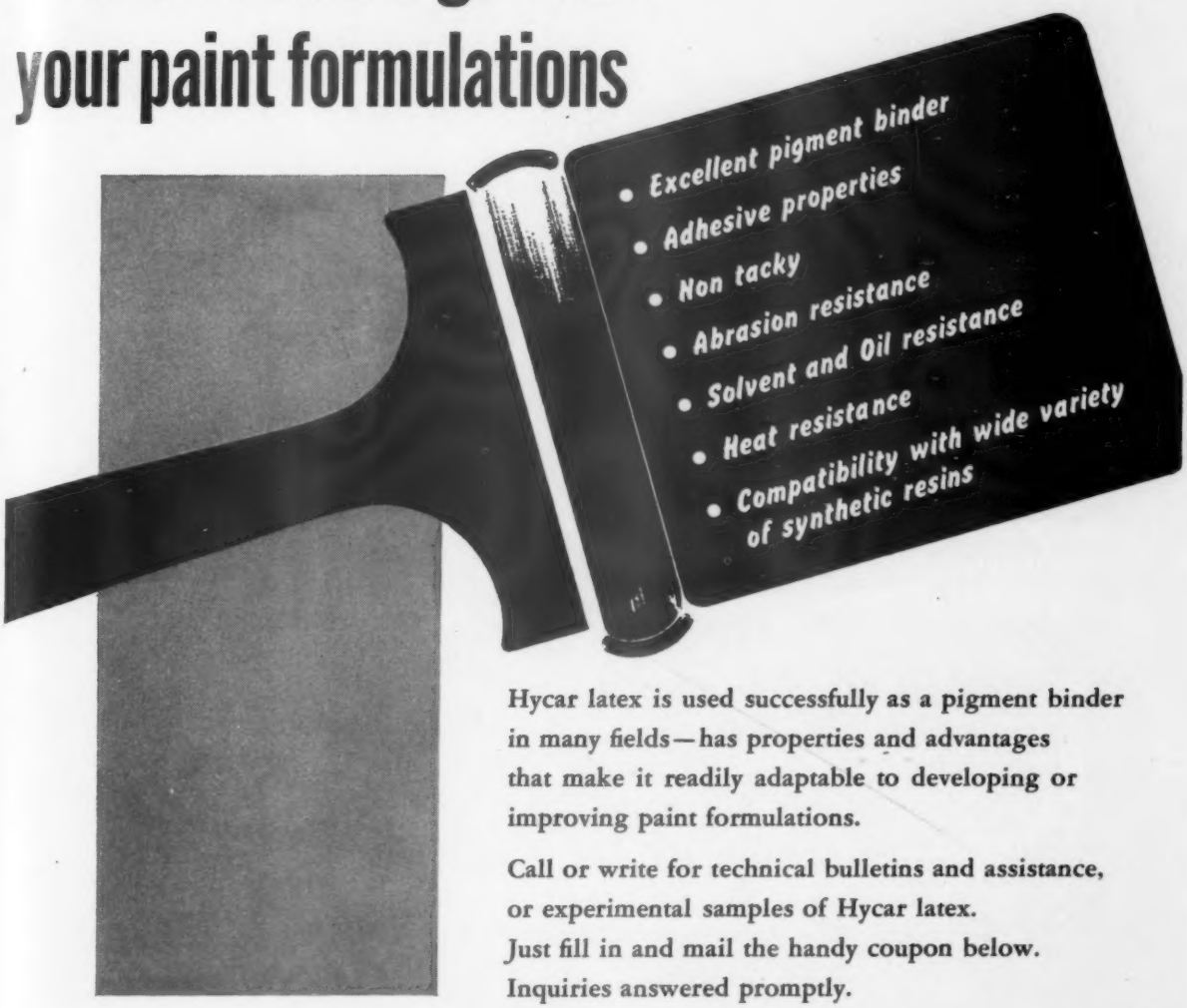
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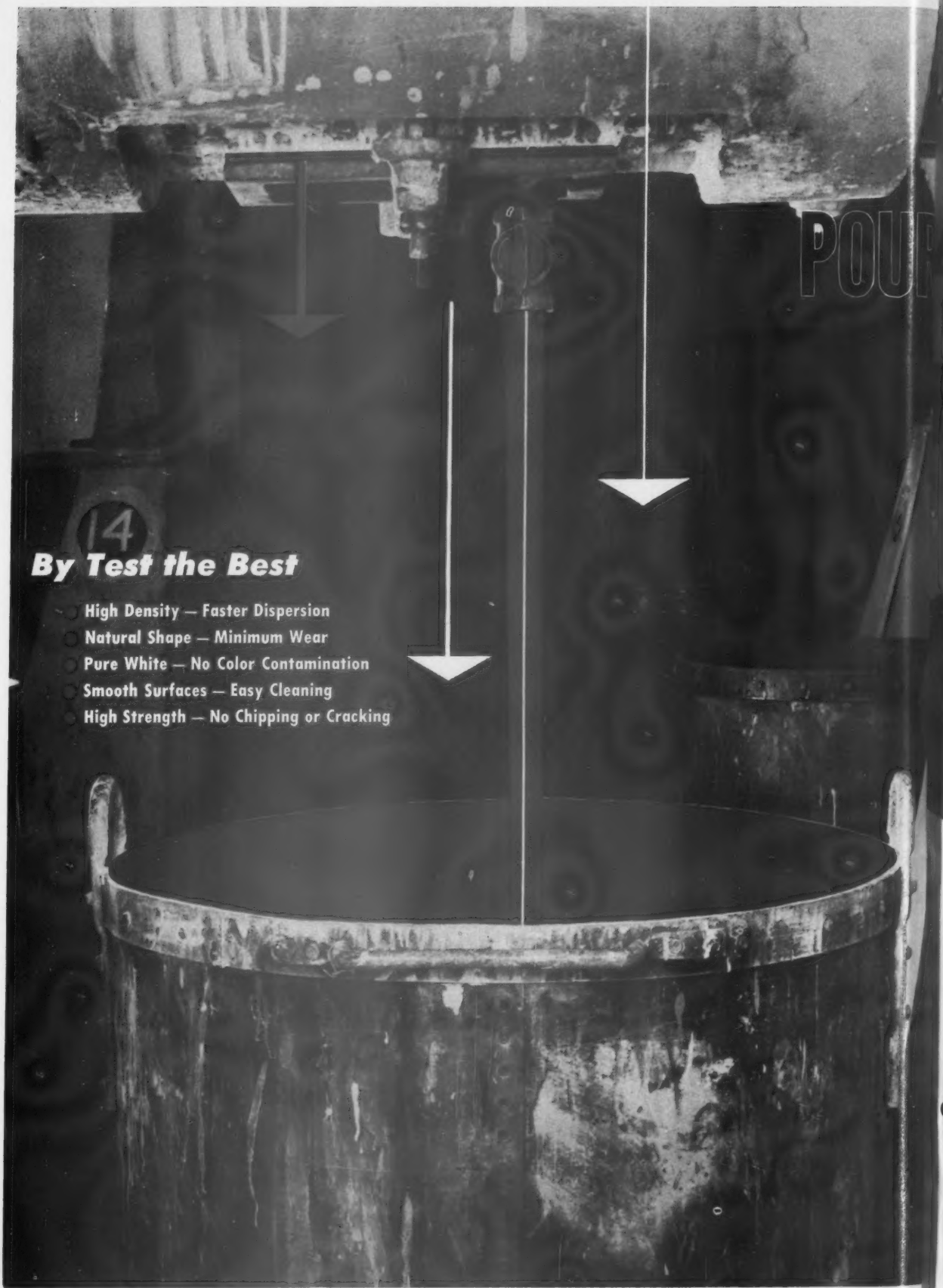
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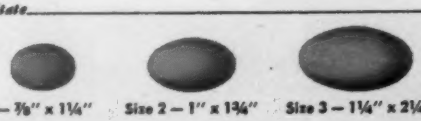

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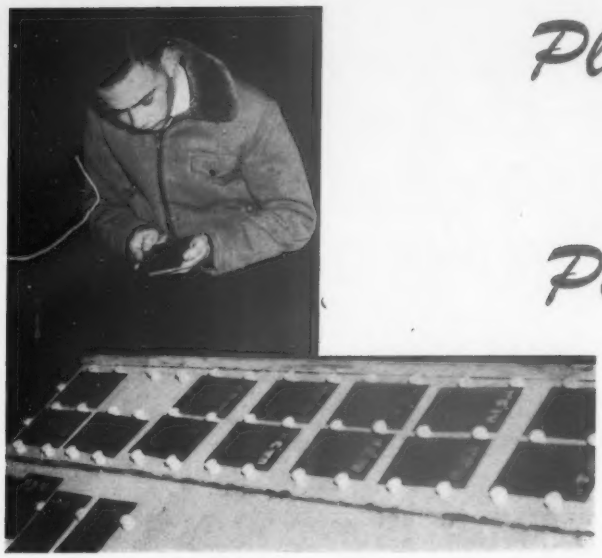


Platy Pigments in Paint Systems

SALTFOG AND MOISTURE— RESISTANCE STUDIES

BY

DR. MAX KRONSTEIN GEORGE P. MacNIECE MARION M. WARD

College of Enginerring
New York University

CONSIDERABLE attention has been given in the literature to the structural effect of platy pigment materials on the formation and behavior of paint films.

The first part of this paper is concerned with experimental results of paint systems containing platy extenders in saltfog exposure (under 1000 hrs.) as compared to corresponding paint systems containing other types of extenders or no extenders at all.

In conjunction with the above study, it was of interest to determine what relationship, if any, was there between the pigment component and platy extender in influencing the moisture resistance of such a system. Part II deals with this particular study.

In addition to visual examination, the electrographic printing method was also used to evaluate exposure tests in these studies. This method has been described by *Max Kronstein, Marion M. Ward and Robert Roper* in their paper, *"Evaluation of Organic Coatings By Electrographic Printing," Industrial and Engineering Chemistry, Vol. 42, Aug. 1950, 1568.*

TABLE I
VISCOSITIES

Paint		Poises
A	---	10.8
B	---	10.8
C	---	10.0
D	---	10.2
E	---	10.0
F	---	11.0
G	---	11.4
H	---	11.4
I	---	11.0
J	---	10.8
K	---	9.8
L	---	11.6
M	---	11.0
N	---	11.4
O	---	9.8
P	---	11.6

PART I — SALTFOG EXPOSURE

Paints Used

As a binder, an alkyd resin solution was used, Rezyl 412-1 (50% solids) of the American Cyanamid Company. A lithopone was used as pigment, the commercial Albalith No. 11 (28.5% Zn S.) of the New Jersey Zinc Company. In one sample, Control Sample A, lithopone was used without any extender. The extenders used for this test series were five 325-mesh wet ground micas, three different mica-like products, magnesium silicate, barytes, calcium carbonate, calcium sulphate, silica No. 1, silica No. 2 and whiting.

The paints were prepared by mixing and milling 3 parts of the alkyd resin solution with 2 parts of the pigment. In extended pigments, 25 % extender was used with 75% lithopone. This paste was then thinned, using as diluent 11-22 parts of toluene to 350 parts of paste. The viscosities (Table 1) were kept as nearly alike as possible to get comparable results.

Application

The paints were applied with a Bird Applicator to clean, vapor-degreased, bare, steel panels (cold rolled automotive body steel, standard gage No. 20, 0.035" thickness).

The painted panels were air-dried for 30 minutes in a horizontal position and then baked at 110°C. for 30 minutes also in a horizontal position. They were aged for 5 days at 50°C. before testing. The uncoated parts of the front and the back of the panels were then given a protective coating of a pure, phenolic-tung oil aluminum paint. Uniform x-lines 1 inch long were made with a razor blade on the paint specimens.

Preliminary tests had shown that too thin a film does not produce comparable results under the severe test conditions of saltfog exposure. Therefore, a dry-film thickness of between 2 and 3½ mils was used for the entire series. Slight variations in film thickness (Table II) occurred due to the different bulking values of the different extenders, and also due to the fact that the paint panels were not absolutely flat. To counteract these differences, each specimen of paint was applied on three panels and the film thickness was determined at three points on each panel.

Evaluation of the Paints

Electrographic prints were made of each panel before saltfog exposure to determine the initial state of the coatings. These prints were generally satisfactory and indicated proper film application. The panels were then put in the saltfog chamber (Type BCA, Size 2), which was operated at 95°F., using a 10% NaCl solution. Thereafter at certain time intervals the panels were evaluated (a) by visual inspection and (b) by electrographic printing. For these tests, the panels were washed with clean running water and air-dried. The prints, which have been kept as records, indicate the progress of the underfilm spreading of the moisture, the loss of adhesion of the film and the permeability of the film to moisture. Visual inspection on the other hand, locates the beginning of blistering before the penetration of moisture at these points has progressed far enough to be indicated in the prints. A close correlation between the two methods was observed throughout the series, and also on the prints made on the three parallel panels of each paint sample.

Visual Inspection

Graphs I, II and III present an evaluation of all the paints which were tested by visual inspection at time intervals from 22 hours to 1000 hours. The numbers from 1 to 17 indicate varying degrees, or extent, of blistering as shown in Table III. The panels were taken from the series when the coatings had deteriorated to their ultimate extent.

TABLE II
FILM THICKNESSES

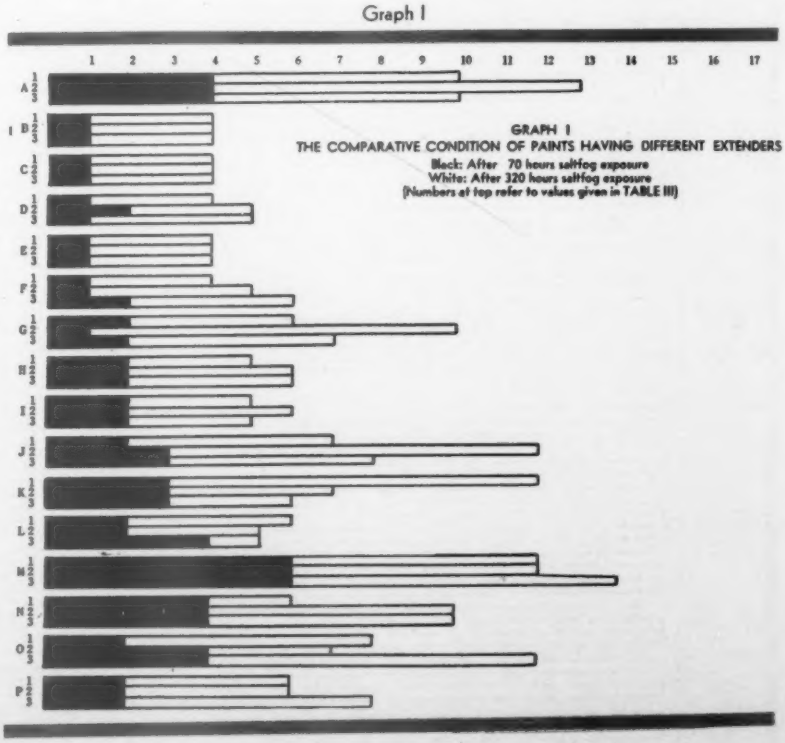
Panel	Magne-gage	Panel	Magne-gage
A-1	.0025	I-1	.0020
A-2	.0023	I-2	.0019
A-3	.0027	I-3	.0032
B-1	.0037	J-1	.0033
B-2	.0035	J-2	.0028
B-3	.0035	J-3	.0028
C-1	.0027	K-1	.0024
C-2	.0028	K-2	.0025
C-3	.0027	K-3	.0027
D-1	.0028	L-1	.0025
D-2	.0027	L-2	.0018
D-3	.0024	L-3	.0023
E-1	.0036	M-1	.0020
E-2	.0035	M-2	.0021
E-3	.0038	M-3	.0018
F-1	.0038	N-1	.0030
F-2	.0028	N-2	.0035
F-3	.0025	N-3	.0020
G-1	.0030	O-1	.0025
G-2	.0030	O-2	.0032
G-3	.0025	O-3	.0020
H-1	.0030	P-1	.0036
H-2	.0034	P-2	.0038
H-3	.0028	P-3	.0028

TABLE III
CODE USED FOR VISUAL EVALUATION OF PAINT FILMS

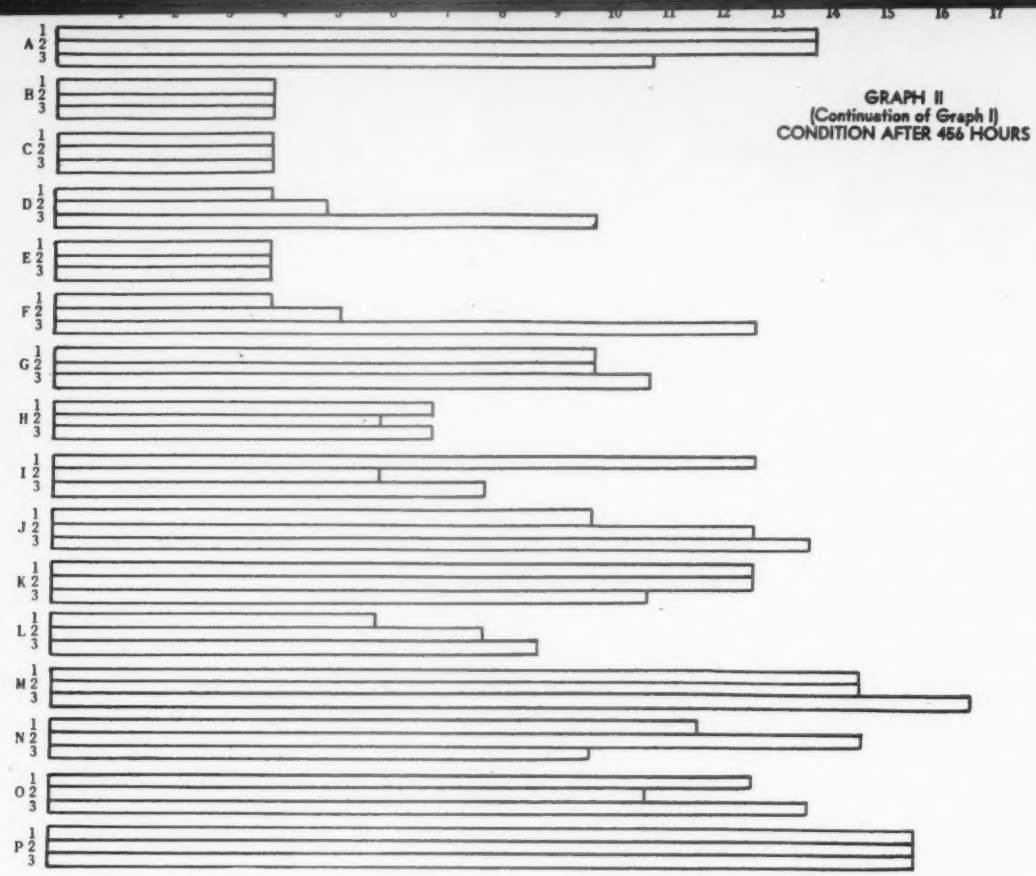
Grade No.	Meaning
1	No evidence of blistering
2	Slight blistering adjacent to x-mark
3	Blisters and underfilm penetration to 1/16" from x-mark
4	" " " " " 1/8" " "
5	" " " " " 3/16" " "
6	" " " " " 1/4" " "
7	" " " " " 5/16" " "
8	" " " " " 3/8" " "
9	" " " " " 7/16" " "
10	" " " " " 1/2" " "
11	" " " " " 5/8" " "
12	" " " " " 3/4" " "
13	" " " " " 1" " "
14	Blisters and underfilm penetration to more than 1" from x-mark
15	Peeling that leaves a bare spot
16	Entire panel blistered
17	Breaks down

Tables II and III

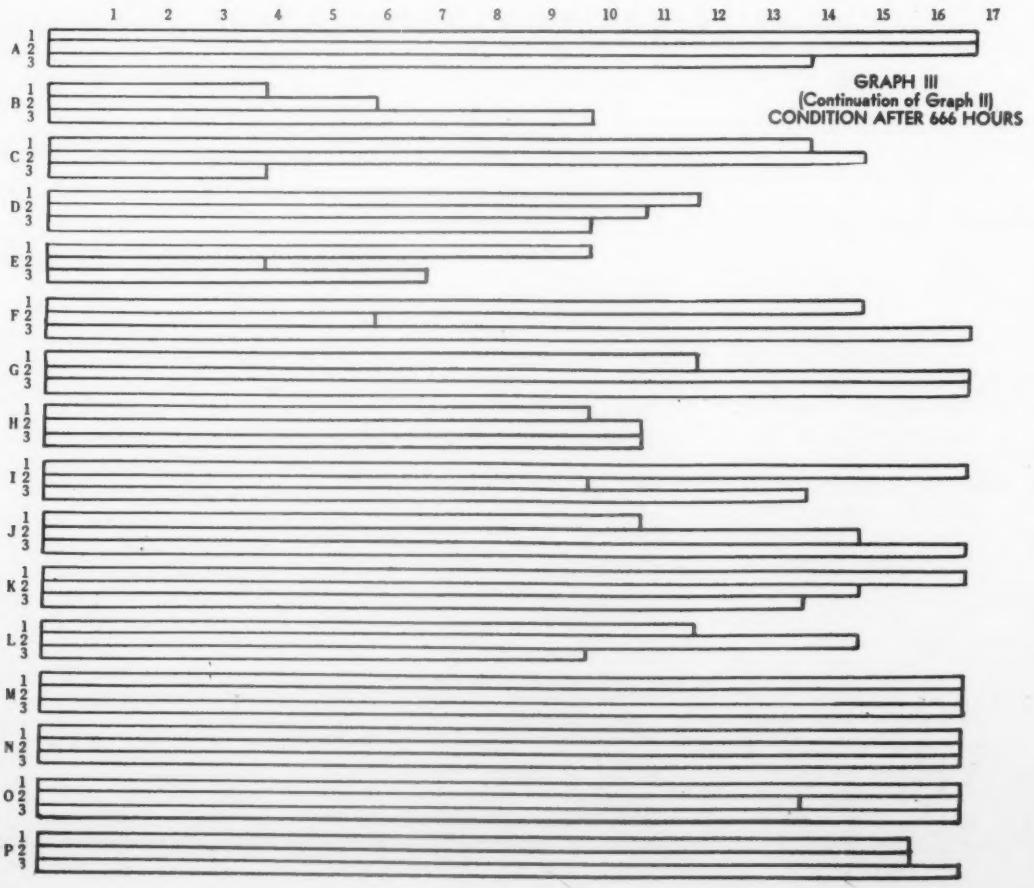
Graph I



GRAPH I
THE COMPARATIVE CONDITION OF PAINTS HAVING DIFFERENT EXTENDERS
Black: After 70 hours saltfog exposure
White: After 320 hours saltfog exposure
(Numbers at top refer to values given in TABLE III)



GRAPH II
(Continuation of Graph I)
CONDITION AFTER 456 HOURS



GRAPH III
(Continuation of Graph II)
CONDITION AFTER 666 HOURS

Graphs II and III

Electrographic Printing

Figure I shows the comparative saltfog life of two different paints; one containing wet ground mica and the other containing another extender which deteriorated very early in the test series.

Summary

The work has shown that most extenders improve the saltfog resistance of the paint films, at least in the beginning of the exposure time. The extenders differed, however, in the rate of deterioration of their respective paint coatings. Some compounds progressed continuously at an even rate of deterioration, while others maintained a relatively good condition for a long time and then broke down rapidly. Panels of the same paint differing somewhat in film thickness showed that the thinner film usually broke down first. The formation of blisters always began in the region of the x-mark, indicating that the blisters are connected with the underfilm spreading of moisture. The study also indicates that the different extenders which were used influence in varying degrees the underfilm spreading characteristics of the paint.

The platy mica extenders as used in these formulations evidently slowed down the initial blistering of the paint films under comparative conditions.

PART II — EFFECT ON MOISTURE RESISTANCE

It was of interest to determine what limiting amounts of these particular extenders are required to influence the moisture resistance of a paint system.

Platy pigments have been reported to be effective in increasing moisture resistance by their tendency to arrange their particles with the broad dimension horizontal to the direction of moisture diffusion through the film.[1] This observation agrees with the experience of another author who found that the addition of mica increased the life of coatings for transformers.[2] It is obvious, however, that the use of such inert substances of specific shape would have certain limits beyond which they might not be beneficial to the moisture resistance of the film, and that excessive use might set up a moisture migration between the various platy particles.

Quantitative tests are, therefore, to be desired.

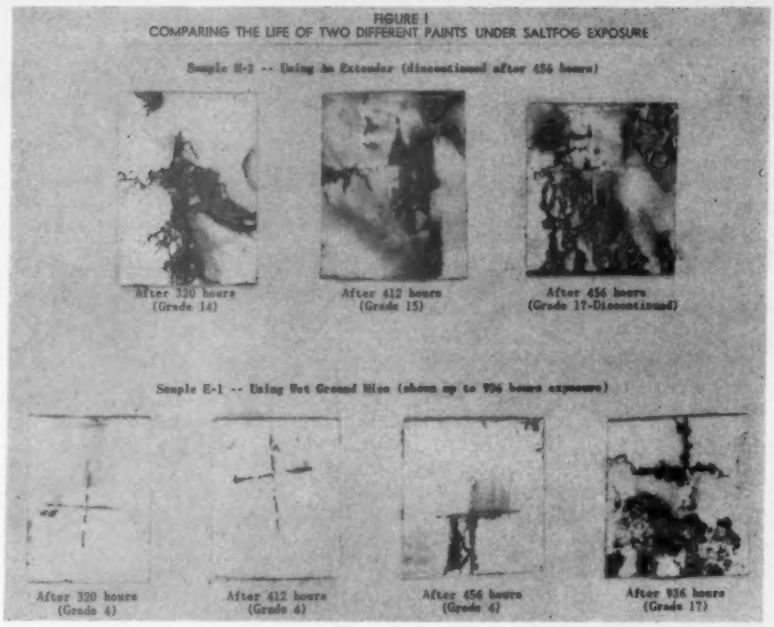


FIGURE I
COMPARING THE LIFE OF TWO DIFFERENT PAINTS UNDER SALTFOG EXPOSURE
Sample E-2 -- Using An Extender (discontinued after 456 hours)
After 320 hours (Grade 14)
After 412 hours (Grade 15)
After 456 hours (Grade 17-Discontinued)
Sample E-1 -- Using Wet Ground Mica (shown up to 936 hours exposure)
After 320 hours (Grade 4)
After 412 hours (Grade 4)
After 456 hours (Grade 4)
After 936 hours (Grade 17)

Figure I

Test Program

An evaluation of the effect of mica additions in coatings requires its systematic use in successive coats and formulations in complete paint systems. This means, its use on a suitably pretreated substrata (such as pretreated steel panels); the use of a primer; and two top coats. The amount of mica would have to be varied in each and all of the paint materials. Furthermore, it must be considered that mica has been reported to be successful in the intermediate coat;[2] and also that one of the U.S. Navy Specifications (Bureau of Ships Paint Formula No. 116, dated June 1, 1949) utilizes mica particularly in primer materials for outdoor application. The workers carrying on this investigation are aware that studies on complete systems with many variables require extensive tests of a great number of different systems.

In order to obtain information on the influence on moisture resistance of certain ratios of mica as part of one specific paint material under uniform formulation, application, curing, and exposure, the following series of tests was carried out, Series I of which is reported herein:

Test Series I — In this series, a basic paint formulation having an alkyd resin binder and white lead carbonate pigmentation is varied by substituting subsequently certain percentages of white lead with wet ground mica (325 mesh). The percentages used are all increments of 12.5% from zero to one hundred.

Test Series II — In Series II, the investigation was made with a narrower range of substitutions. Based on the results of Series I, the ratio of mica content was held within the limits of zero and 30% of the pigment content, using increments of 5% in the successive variations of the basic alkyd/white lead formulation.

Test Series III — In a third series, studies were made using the mica extender together with a composite zinc sulfide/barium sulfate pigment.

Series I

The base paint used in this series consisted of 40 parts white lead carbonate and 60 parts of short-oil alkyd/resin solution with 50% sol-

VISUAL OBSERVATIONS ON THE PAINTS USED IN SERIES I SAMPLES EXPOSED 1000 HOURS IN SALT-FOG CHAMBER

VISUAL APPEARANCE

PAINT TYPE	% MICA	THICKNESS (mil)	AFTER 96 HRS.	216	264	336	432	528	600	672	720	816	912	1000
X-0	0	a) 2.3 b) 2.5	good good	less than 1/16*	to 1/8 to 1/8	3/16 1/8	3/16 1/8	1/4 1/8	1/4 5/16	1/2 3/8	1/2 7/16	1/2 7/16	1/2 7/16	1/2 7/16
X-1	12.5	a) 2.6 b) 2.7	good good	good good	good slight	slight slight	1/16 1/16	1/16 1/16	1/16 1/16	1/8 1/8	1/8 1/8	1/8 1/4	1/8 1/4	1/4 1/2
X-2	25.0	a) 3.0 b) 4.0	good good	good good	good good	good good	good good	good good	good good	good good	good good	1/16 1/16	1/16 1/16	1/8 1/8
X-3	37.5	a) 2.6 b) 2.75	good good	good good	good good	increasing rust increasing rust								
X-4	50.0	a) 2.6 b) 3.7	good good	good good	good good	increasing rust increasing rust								
X-5	62.5	a) 3.7 b) 2.9	good good	rusty rusty	rusty rusty	increasing rust increasing rust								
X-6	75.0	a) 2.7 b) 2.9	good good	rusty rusty	rusty rusty	increasing rust increasing rust								heavy erosion
X-7	87.5	a) 2.5 b) 2.75	good good	rusty rusty	rusty rusty	increasing rust increasing rust							heavy erosion	heavy erosion
X-8	100.0	a) 2.7 b) 2.4	good good	rusty rusty	rusty rusty	increasing rust increasing rust							heavy erosion	heavy erosion

NOTE: *The numbers indicate extent in inches of the blistering from the test cross at the time of observation.

Table IV

ids (Rezyl Resin 330-5, 39% P.A.A., American Cyanamid Co.). For better application, 11.1 parts of toluene were added as a thinner.

This paint has been designated as X-0 for these tests. Variations of this base paint have been designated as follows:

Designation (Type)	Percent mica	Designation (Type)	Percent Mica
X-0	0	X-5	62.5
X-1	12.5	X-6	75.0
X-2	25.0	X-7	87.5
X-3	37.5	X-8	100.0
X-4	50.0		

In the modifications above, the total amount of pigment remained unchanged; but in each subsequent variation, 5 parts of the initial 40 parts of white lead carbonate were replaced by 5 parts of wet ground mica (325 mesh). In view of their different specific weight, increased thinner (toluene) was added to produce corresponding film thickness. Paint type X-8 thus required 36 parts of toluene for application.

The paints were applied with a film applicator on clean, vapor-degreased steel panels. The wet film thickness was 10 mil. The dry film thickness of the various specimens is given on Table IV. Two panels of each type were used in the subsequent exposure tests.

The paints were baked for 1 hour at 105°C. and aged for 5 days at 50°C. before exposure.

For comparative tests of the various paint specimens, the panels were exposed in the salt-fog chamber. Here a 10% sodium chloride solution for salt-fog was maintained at 95°F. At certain intervals thereafter, the specimens were examined visually and electrographic prints were made. The visual observations are given on Table IV. Some of the especially characteristic electrographic prints are reproduced on Figures II and III.

Findings

Table IV and Fig. II indicate that during the first 500 hours of exposure, the presence of 12.5% and of 25% wet ground mica improved the salt-fog resistance of the coatings.

Table IV and Fig. III show that when mica is used in a still higher ratio, the white lead film loses its uniformity. With 37.5% mica this is apparent only after the first 264 hours of the exposure tests when increasing rust developed. When 50% or more mica was used in substitution for white lead carbonate, the electrographic prints showed spots of porosity after 96 hours salt-fog exposure. When 62.5% mica or more was used, rust spots were visible after 216 hours exposure. When 75% and 87.5% mica were used, the character of the paint was changed from a film with local points of porosity to one having strong underfilm spreading of moisture and increasing rust formation. These specimens showed heavy erosion.

Summary

These tests show that the use of the platy extender, wet ground mica, within the ratios of 12.5% and 25% mica, does improve the salt-fog resistance of the paint. Further increase in the mica content decreases the protective value of the paint films under identical test conditions. This might be caused by the decrease in uniform reactivity between the white lead pigment and the binder; or it might be caused by too high concentration of platy substance which might interfere with the normal arrangement of the platy particles in the film.

Series II

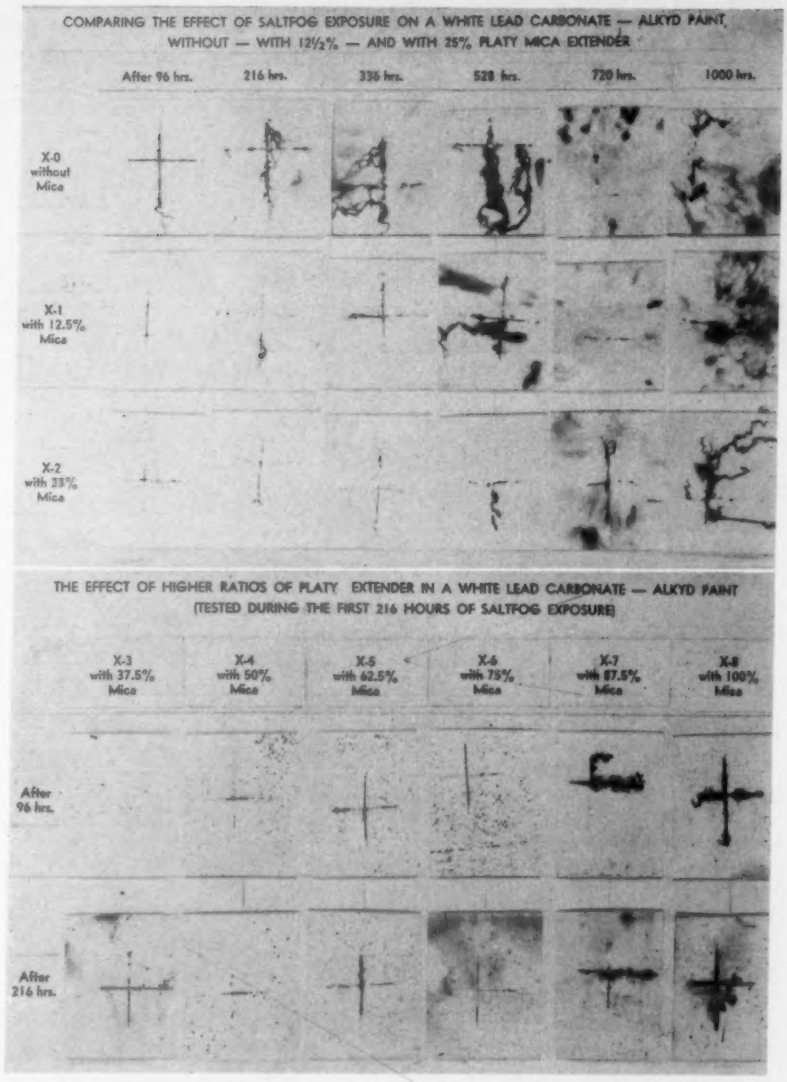
In this Test Series II, a more detailed study is made of the ranges where the addition of platy extender substance to a reactive paint pigment increases the moisture or salt-fog resistance of the paint. The specimens of the present series, therefore, have a mica content of 5%, 10%, 15%, 20%, 25%, and 30% of the pigment.

The base paint used in this series consisted of 40 parts sublimed white lead and 60 parts of a medium oil alkyd-resin solution with 50% solids (Rezyl Resin 807-1, 30% P.A.A., American Cyanamid Company). For application, 5 parts of toluene was added as a thinner.

This paint was designated S-1 for these tests. Variations made on this base paint have been designated in Table A.

In the modifications above, the total amount of pigment remained unchanged, but in each variation, a portion of the sublimed white lead was replaced by an equal amount of wet ground mica (325 mesh). In view of their different specific weights, increased thinner was added to produce corresponding film thickness. Paint S-7 thus required 9.5 parts of toluene for application.

The paints were applied with a film applicator to clean, vapor-degreased steel panels which were baked for 1 hour at 105°C. and aged for 5 days at 50°C. Then, with a sharp blade, cross marks were cut through the applied film to the metal base and the panels were hung in the salt-fog chamber. Here a 10% sodium chloride solution was maintained at 95°F.


COMPARING THE EFFECT OF SALTFOG EXPOSURE ON A WHITE LEAD CARBONATE — ALKYD PAINT, WITHOUT — WITH 12½% — AND WITH 25% PLATY MICA EXTENDER
After 96 hrs.
216 hrs.
336 hrs.
528 hrs.
720 hrs.
1000 hrs.
X-0 without Mica
X-1 with 12.5% Mica
X-2 with 25% Mica
THE EFFECT OF HIGHER RATIOS OF PLATY EXTENDER IN A WHITE LEAD CARBONATE — ALKYD PAINT (TESTED DURING THE FIRST 216 HOURS OF SALTFOG EXPOSURE)
X-3 with 37.5% Mica
X-4 with 50% Mica
X-5 with 62.5% Mica
X-6 with 75% Mica
X-7 with 87.5% Mica
X-8 with 100% Mica
After 96 hrs.
After 216 hrs.

Figures II (top) and III (bottom) of Series I

At certain time intervals from 48 hours exposure to 1000 hours exposure, the specimens were removed from the test chamber, rinsed in clear running water, and allowed to dry. They were then examined visually and electrographic prints were made. The visual observations were recorded in terms of the extent of blistering from the cross marks, such as ⅛ inch, ½ inch, ⅝ inch, etc. If there was practically no blistering, they were noted as VSB (Very Slight Blistering). The

Designation (Type)	Percent Mica	Designation (Type)	Percent Mica
S-1	0	S-5	20
S-2	5	S-6	25
S-3	10	S-7	30
S-4	15		

Table A

VISUAL OBSERVATIONS ON THE PAINTS USED IN SERIES II AFTER EXPOSURE IN THE SALT-FOG CHAMBER

(VSB indicates Very Slight Blistering. Figures refer to extent of blistering, in inches, from cross-lines)

PAINT SAMPLE	% Mica	PANEL No.	VISUAL APPEARANCE AFTER 48 HRS.	144 HRS.	240	312	360	456	552	624	720	792	864	924	1000 HRS.
S-1	0	1	VSB	1/8	3/16	3/16	3/16	3/16	5/16	3/8	3/8	3/8	3/8	3/8	3/8
		2	VSB	1/8	3/16	1/4	1/4	1/4	5/16	5/16	3/8	1/2	1/2	1/2	5/8
S-2	5	1	VSB	1/16	1/8	3/16	3/16	3/16	1/4	1/4	1/4	1/4	3/8	7/16	7/16
		2	VSB	1/32	1/8	3/16	3/16	3/16	1/4	1/4	3/8	7/16	7/16	7/16	1/2
S-3	10	1	good	good	1/16	1/16	1/16	1/8	1/8	3/16	3/16	3/16	3/8	3/8	3/8
		2	good	VSB	1/16	1/16	1/8	1/8	1/8	3/16	3/16	3/16	3/16	1/4	5/16
S-4	15	1	VSB	VSB	1/16	1/16	1/16	1/8	3/16	1/4	5/16	3/8	3/8	3/8	3/8
		2	VSB	VSB	1/16	1/8	1/8	1/4	1/4	1/4	1/4	7/16	1/2	1/2	1/2
S-5	20	1	VSB	VSB	VSB	1/16	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/4	1/4
		2	VSB	VSB	1/16	1/16	1/16	1/8	3/16	3/16	3/16	3/16	3/16	3/16	1/4
S-6	25	1	VSB	VSB	VSB	1/32	1/32	1/16	1/16	1/16	1/8	1/8	1/8	1/4	1/4
		2	VSB	VSB	1/16	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/8	3/16	1/4
S-7	30	1	good	good	VSB	VSB	VSB	1/16	1/16	1/16	1/8	1/8	1/8	1/4	1/4
		2	good	good	VSB	VSB	VSB	1/16	1/16	1/16	1/8	1/8	1/8	1/4	1/4

Table V

visual observations are given on Table V. The electrographic prints give a pictorial record of the moisture permeability of the film and underfilm-spreading of moisture. Some of these prints are reproduced on Figures IV and V.

Findings

The results, as illustrated in Figures IV and V, show that there is little difference in the behavior of the paint without any mica and with 5 or 10 percent mica, as far as the moisture or salt-fog resistance of the paint is concerned. The best results were shown in the samples with 20-25% mica and 75-80% white lead.

It was found that when the mica was increased to and beyond 25%, certain difficulties occurred in the milling procedure. The mica then had the tendency to accumulate at the edges of the rollers and made it difficult to maintain a uniform grind.

The successful use of 25% mica (325 mesh) in salt-fog exposure tests of lead-pigmented paint agrees with a published article[3] showing results of tests on red lead primers exposed for 55 months in the marine atmosphere of the Marine Basin, Sayville, L. I. Here very good results were obtained with a red lead/zinc oxide/zinc chromate/mica pigmentation containing 25% mica and using an alkyd/phenolic varnish binder.

Series III

In the third series, reported here, the moisture resistance of a paint film composed of mica with lithopone, (a zinc sulfide/barium sulfate pigmentation), in an alkyd binder, has been tested.

In the tests reported here, the base paint formulation consisted of the following:

40 parts lithopone (Albalith 11, 28.5% ZnS, New Jersey Zinc Company)

60 parts short-oil alkyd resin solution (Rezyl Resin 330-5, 50% solids, 39% P.A.A., American Cyanamid Company)

4.3 parts toluene.

This base piant is designated as L-O for these tests. Variations were made by substituting certain portions of mica for lithopone. As in the earlier tests, the total amount of pigment remained unchanged but the mica content in the pigment was varied from sample to sample. The mica used was a wet ground mica, 325 mesh. The amount of toluene which was used for application increased from 4.3 parts for the base paint to 14.3 parts for the paint with 100 percent mica extender.

The designations for the paint samples and the percent of mica content are given in Table B.

The paint was applied with a film-applicator to vapor-degreased steel panels 3 in. x 6 in. in size, with a hole at one end for hanging. The dry film thickness of the paints is given on Table VI. Three panels of each kind of paint were prepared.

The painted panels were baked for one hour at 105°C. and aged for 5 days at 50°C. Cross marks were cut through the paint films, preliminary electrographic prints were made, and the samples were hung in a salt-fog cabinet.

For the salt-fog exposure, the same conditions were used as in the earlier series; that is, a 10% sodium chloride solution and a temperature of 95°F.

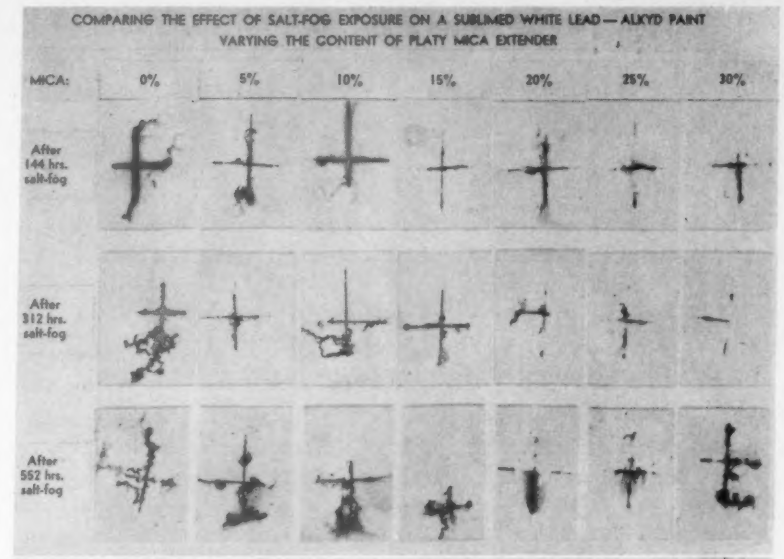
At certain time intervals, the samples were examined visually and electrographically. The visual results are given in Table 1 where the condition of the panels is reported in terms of the formation of rust, peeling, or the extent of blistering from the cross-marks. Figures VI and VII show some of the electrographic prints which were made at selected time intervals. The panel selected in each group was the one having the film thickness closest to .004 mil.

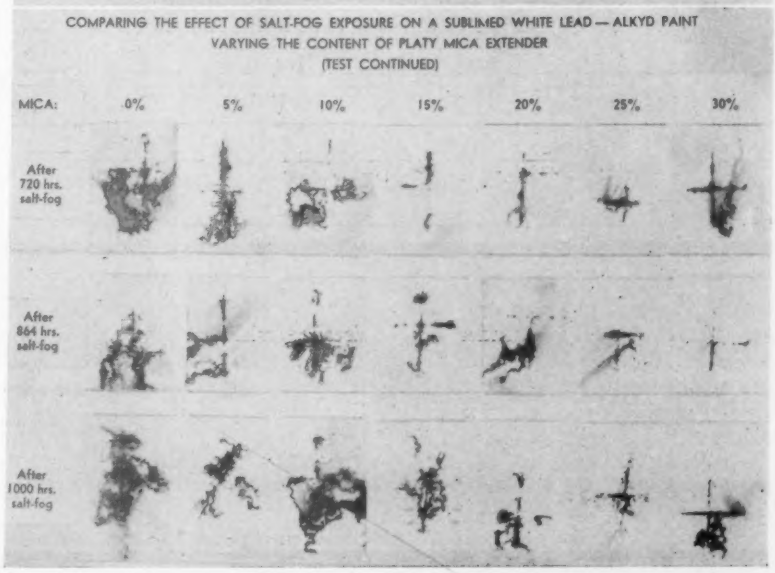
Findings

The visual results given in Table VI as well as the electrographic prints shown in Figures VI and VII indicate that the paint samples with 12.5% and 25.0% mica (Type L-1 and L-2) give films with the greatest resistance to moisture.

In comparing the figures in Table VI with corresponding findings for the paints in the first test series (Technical Bulletin No. 6), it is evident that under the same salt-fog exposure conditions the rate of blistering is greater on these lithopone paints with varying mica content than it was on white lead paints with the same variations of mica content.

In the case of the white lead paints of Test Series I, the increase of mica content from 12.5% to 25% slowed down the rate of blistering, while in the lithopone/mica paints of the present series, the same increase in the mica content resulted in slightly more blistering.





Figures IV (top) and V (bottom) of Series II

Also, by increasing the mica content to 50%, the white lead paints did not show much rusting before 336 hours salt-fog exposure, while the lithopone/mica paint showed rust at 198 hours salt-fog exposure. With still higher percentages of mica, the moisture resistance of the films decreased even further.

This shows that the optimum

Designation (Type)	Percent Mica	Designation (Type)	Percent Mica
L-0	0	L-5	62.5
L-1	12.5	L-6	75.0
L-2	25.0	L-7	87.5
L-3	37.5	L-8	100.0
L-4	50.0		

Table B

VISUAL OBSERVATIONS ON THE PAINTS USED IN SERIES III AFTER EXPOSURE IN THE SALT-FOG CHAMBER

(VSB Indicates Very Slight Blistering. Figures indicate extent of blistering, in inches, from cross lines)

VISUAL APPEARANCE

PAINT SAMPLE	% Mica	PANEL No.	THICK-NESS	AFTER 48 HRS.	138	198	291	339	386	506	544	626	722	818	1000 HRS.
L-0	0	1	.0033	Good	1/4	1/4	3/8	3/8	3/8	1/2	1/2	1/2	5/8	Peeling	Peeling
		2	.0035	Good	1/16	3/16	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1	1
		3	.0040	Good	3/16	3/16	3/8	3/8	3/8	3/8	3/8	5/8	5/8	Peeling	Peeling
L-1	12.5	1	.0025	Good	Good	Good	Good	Good	Good	1/16	1/16	1/16	1/16	1/8	1/8
		2	.0038	Good	VSB	VSB	VSB	VSB	VSB	1/16	1/16	3/16	3/16	3/16	3/16
		3	.0045	Good	Good	Good	Good	Good	Good	Good	Good	Good	1/16	1/16	1/8
L-2	25	1	.0043	Good	Good	Good	Good	VSB	1/16	1/16	1/16	1/8	1/8	1/8	1/8
		2	.0060	Good	Good	Good	Good	Good	VSB	1/16	1/16	1/8	1/8	1/8	1/8
		3	.0038	Good	VSB	VSB	VSB	VSB	1/16	1/16	1/8	1/8	1/8	1/8	1/8
L-3	37.5	1	.0045	Good	Good	Rust				Heavy Rust					
		2	.0038	Rust	Rust										
		3	.0040	Rust	Rust										
L-4	50	1	.0043	Good	Good	Rust				Heavy Rust					
		2	.0040	Good	Good										
		3	.0040	Good	Good										
L-5	62.5	1	.0050	Rust	Rust					Heavy Rust				Erosion	
		2	.0034	Good											
		3	.0040	Rust											
L-6	75	1	.0040	Rust	Heavy Rust					Erosion					
		2	.0040	Rust											
		3	.0040	Rust											
L-7	87.5	1	.0065	Erosion											
		2	.0043												
		3	.0080												
L-8	100	1	.0078	Heavy Rust				Erosion							
		2	.0060												
		3	.0030												

Table VI

percentage of platy extender depends on the composition of the paint pigment itself. A paint with an otherwise reactive pigment reached its greatest moisture resistance with a higher mica content than a lithopone paint containing a high amount of inert substance with the same content of platy extender. This fact is not surprising, but the figures and prints of the present test series show the extent of this influence on the behavior of a paint composition. The formulator of a paint

PIGMENT VOLUME

Test Series I

Paint Sample	% Mica	P.V.
X-0	0	18.32
X-1	12.5	20.85
X-2	25.0	23.22
X-3	37.5	25.58
X-4	50.0	27.55
X-5	62.5	29.62
X-6	75.0	31.43
X-7	87.5	33.35
X-8	100.0	34.92

Test Series II

Paint Sample	% Mica	P.V.
S-1	0	19.10
S-2	5	20.09
S-3	10	21.04
S-4	15	21.96
S-5	20	22.84
S-6	25	23.74
S-7	30	24.78

Test Series III

Paint Sample	% Mica	P.V.
L-0	0	26.0
L-1	12.5	27.23
L-2	25.0	28.45
L-3	37.5	29.6
L-4	50.0	30.75
L-5	62.5	31.91
L-6	75.0	32.9
L-7	87.5	33.92
L-8	100.0	34.92

ill have to take this fact into consideration.

While the present investigations have been so selected as to cover a wide range of compositions from the very reactive white lead to the lithopone with its high content of barium sulphate, it might become desirable to extend this test group to additional pigments like titanium dioxide or iron oxide, in order to give the formulator a wider range of facts for comparing his own formulations accordingly.

Summary

In this series of three studies on the use of mica with reactive and with widely extended pigmentation, it has been shown that a certain percentage of platy extender in an alkyd paint formulation increases the salt-fog or moisture resistance of the dry paint film. It has been shown that the optimum of platy extender to be used differs with the nature of the other pigmentation. In the case of reactive white lead paints, the optimum was found to be between 20 and 25% mica (Test Series I and II). In the case of lithopone — with a content of 28.5% zinc sulfide — the optimum of mica content was lower or around 12.5% of the total pigment used.

Paint films with a too high percentage of mica content showed an increase in porosity and shortened life of the specimen. This could be attributed to the possibility that with a too high concentration of platy matter, some particles will fail to orient themselves parallel to the paint film and may even cause a greater moisture penetration to the steel base than would occur without the use of platy extender. The pinpoint spots which appear in the electrographic prints of the too greatly extended paint formulations would seem to indicate this fact. The work reported here has been done in the paint laboratories of the College of Engineering, New York University as a part of a broad program on wet ground mica.

Pigment Volume Used in Tests

The Pigment Volume of the various paints which were tested has been determined according to the ASTM definition, that is, as the percentage by volume of pigment in the non-volatile portion of a paint. It was calculated as the ratio of the volume of total pigment to the volume of total non-volatile matter (pigment plus non-volatile vehicle) in each of the test paints.

For this calculation, the bulking value of the various pigment materials was determined with the following results:

Material	Bulking Value (Gallons bulked per pound)
Basic white lead carbonate	0.0178
Sublimed white lead	0.01876
Lithopone (28.5% zinc sulfide)	0.0279
Wet Ground mica — 325 mesh	0.04257

The volume of the non-volatile vehicle was 0.1058 gallons per pound.

The paint composition in all the test paints was: 4 parts of pigment and 6 parts of alkyd (50% solids) or 3 parts of non-volatile vehicle.

The pigment volume (P.V.) figures are on preceding page.

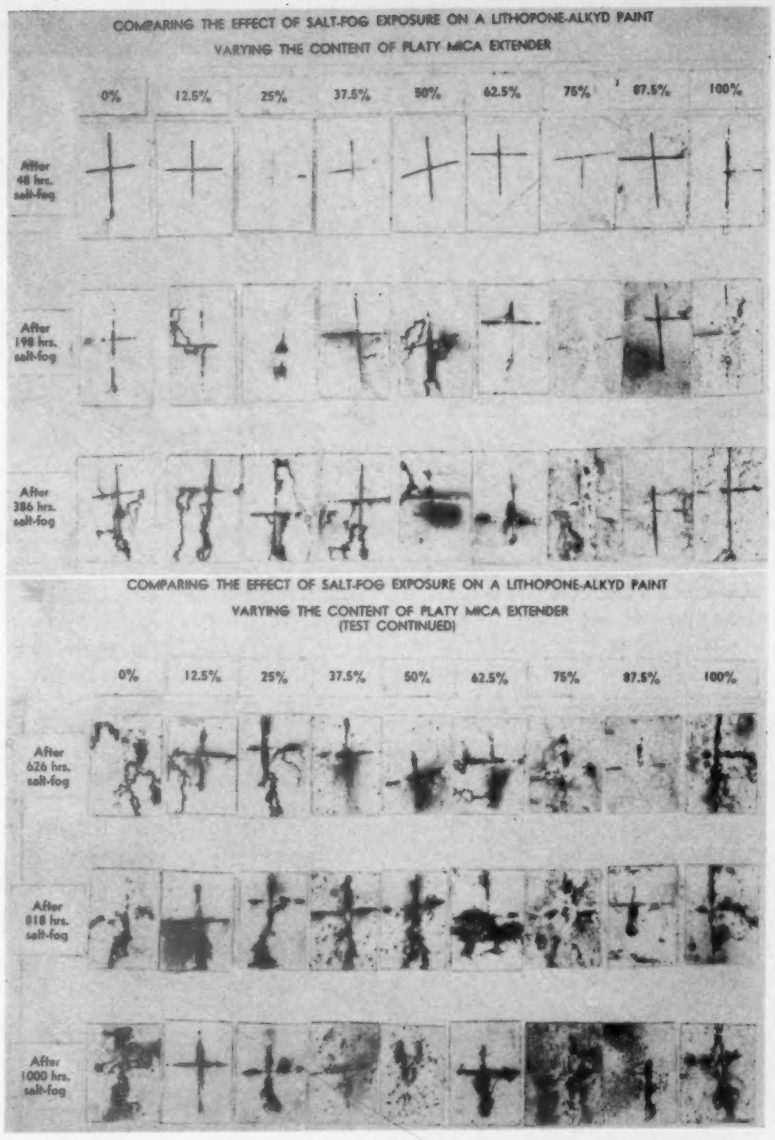


Figure VI (top) and VII (bottom) of Series III

References

1. Elm, A. C., paper presented at the Symposium on Varnish and Paint Chemistry, New York University, (Nov. 1950) — "The Role of the Vehicle in Paints for Submerged Surfaces.
2. Ford, J. G. and Kuti, A. J., Organic Finishing, Vol. 11, No. 11, Pages /-11 (Nov. 1950) — "Mica-base Paint System Doubles Outdoor Exposure."
3. Vander Valk, C. J. Paint and Varnish Production, Vol. 41, No. 1, pp. 8-13 (Jan. 1951).

Acknowledgments

The authors wish to thank Frank DeLong and Alfred W. Norman for helpful services rendered in the experimental work of this project.

PART IV

DEVELOPMENT TECHNICS — THE PRODUCT GOAL

By
HOWARD C. WOODRUFF
Alkyd Products Engineering
General Electric Co.

Developments need a central purpose to give impulse into the market, and general application to keep them in the market. But how shall we decide what projects to start on? How do business environments effect the character of development work? How can we keep track of many projects at once?

This article — the fourth in our series — discusses the step-by-step technic used by the chemist in the laboratory and in working with customers, Development trends in today's changing industrial conditions, Development as a group operation.

ORGANIZED development groups handle many day-to-day problems, and fit them into a long term plan. Organized development groups handle many individuals by directing single actions toward group results. But no matter how many men are concerned, or the size of the job involved, you carry out the fundamental development procedure in a series of steps. These steps are —

1. Determine that a requirement exists for the material or process involved.
   Make sure this material or process is not now available or not now available at a commercially suitable price.
2. Collect previous information in connection with your requirement. Review methods by which previous similar objectives were attained.
3. Construct as much as possible a structure of interrelationships over or around the gap in the information necessary for you to accomplish your purpose.
4. Considering previous information, specifically define the requirements you need to fulfill. Point out items that require full development.
5. Make a list of possible things or modifications of existing things that would fulfill your requirements.
   Your most important and original contribution to a development project lies here. The list of possibilities starts off your journey and demands your best judgment and experience.
6. Experimentally test out the possibilities you listed. Experiment as follows:
   (a) Establish test methods that will tell you reliably and accurately
   —when you have made a product that fulfills your requirements.
   —when your requirements are not fulfilled, in what way they are not fulfilled and in what direction you are going.
   (b) Produce the desired product experimentally.
   (c) Test your product in accordance with the test methods.
7. Note the places where your first list of possibilities failed.
   Do the necessary research work to give a precise accounting for the reasons of these failures.
8. Prepare a revised list of possibilities modified in accordance with your new test and research information.
9. Retest these revised possibilities in accordance with your test methods.
10. Continue digging out possibilities and making tests until you can make an approximately suitable product.
11. Critically examine your approximate product by asking these questions:
    —Have all reasonable possibilities been examined and are you sure the one you selected is the best?
    —Is the necessary raw material and equipment available to produce your product or is it within reasonable reach? Answers to these questions

Editor's Note: Mr. Woodruff writes these discussions based on his own varied experiences. The facts and examples he uses do not necessarily represent the practices of any single company.

point out the need for further experimental refinements. Make the indicated changes.

12. Prepare enough of your product for your customer to test it. Repeat the preparation with adequate controls to assure yourself you can repeat your results.
13. Pilot your product through the customers laboratory and plant. Zero your product into final commercial form by making the revisions shown necessary by actual use.
14. Summarize your work, pointing out significant results. Report results in a manner to get understanding and to secure appropriate action.

Each problem you meet will be somewhat different, but the principles you use to solve them do not change.

You will note that these steps, which represent the individual phases of a development, are technical in nature.

But the organizational problems that come up when you attempt to plan and coordinate a number of development projects at once are the most serious facing the Coating Materials Industry today. To handle the many problems that arise in mass development work, we see organized development work evolving today.

An Industrial Battleground

WHENEVER Sales, Production, Management or a Customer requires a new product, a new method, or a new application, they pass the requirement along to the Development group. They voice their requirements as often and as fast as they arise. The Development Department in this way builds up an accumulation of needs and requirements. These demands, added to the ideas naturally brought up by the development department itself, converge to make your Development Department into a spearhead of force operating in an industrial battleground.

On this battleground, the forces of ideas, products, supplies, demands, information, experience, uses and human relations maneuver according to definite strategies. Considered from the standpoint of function of parts and sequence of actions necessary for the forward motion of strategies an industrial development program closely resembles a military campaign. In this "battle" environment, the Profit-getting-team tries out its plans for size and strength, knowing that today's industrial conditions, like today's military conditions favor offensive tactics rather than defensive.

Score Keeping and Objective

THE TIME and score in this industrial contest is kept by product goals; Development progress being mesured by the number and value of products marketed. The Development Team does not forget that the final objective is to satisfy customer's needs at a profit and that the only way to do this is to transform raw materials and exchange products.

We rarely aim our development forces at one product alone. Sound and economical working implies that we direct our work toward a group of products. In this way, a development campaign, like a military campaign seeks first to take and then to hold an area of territory or a cluster of products. Over a few years, Development can cover a number of fields in a series of campaigns. Industrial and military plans alike, if significant results are to be gained, must be intelligently planned and courageously carried out.

Just as a military campaign consists of a series of battles and operations connected together and pointed toward enveloping a certain area, so a development program consists of a connected series of individual units of development. These units are regarded as projects. From the standpoint of long-term Development, projects are related to one another and fit into a pattern.

Pattern in Development

WE ARE often aware of the pattern nature of development programs. In many cases however, the pattern of a development program is not clear cut until after the program has been started and some data has been accumulated. We can do our development work most effectively when we are aware of the particular pattern involved.

One way you can determine what pattern a development is following and likely will follow further is to reexamine the conditions causing the project to begin. There are three main reasons for starting a project and three corresponding types of projects.

A Chain Type Development starts because investigators in another field have made a new raw material available. In the Coatings Materials Industry, we observe that a new raw material can make a new series of coatings possible. To actually get these new products into use we need new application methods and new production technics. In this way a chain of projects aimed at fulfilling these needs has a beginning.

A Competitive type development can start when an established product or technic fails to do a necessary job. In the business situation, the sales of an established item at some point begin to decline. To remedy this, development programs start. They aim at reestablishing or increasing the sales. In turn these requirements follow through to seek out more efficient production, more realistic sales approach, less expensive or alternate raw materials. In this competitive vein a network of developments start up.

A planned campaign development can start when the men responsible for development projects can forsee a need that will come up in the future. They can forsee the need on the basis of data on existing industrial conditions and by understanding trends. Foreseeing the need, they set up the necessary program to fulfill the requirement. In this type of working, developed products are available when needed. Systematic operations and advance planning are necessary to accomplish this. The men carrying out a planned campaign have definite ideas about where they are going because they work from an understanding of structure and build-onto structure. They are interested in but not alarmed about competition because they know their own plans are soundly based. They understand they are working toward the fulfillment of real needs and whatever starting materials or processes or equipment they need, they will design and provide it and accomplish their purposes.

Step by Step

AN INDUSTRIAL development engineer, maintains the "long range" point of view during his planning operations. But when he gets down to doing the job he breaks it up into many short steps

A COMMERCIAL SITUATION

Name of Product Considered:

REQUIREMENTS TO BE MET IF PROJECT IS TO BE ACCOMPLISHED

Expenditures

Time
Men
Equipment

Research
Development- Laboratory
- Pilot Plant
- Sales Development

Relation of Requirements to actual ability to meet them

CONTINGENCIES TO BE CONSIDERED AND SATISFIED IF PROJECT IS TO BE DONE

Suitable Raw Material Supply Availability

Product line with Industry Trend

Comparison to Competetive Products favorable unfavorable

Market and Customer Requirements stability, long term, actual or stated, current requirements.

Actual importance of product in question to the carrying on of customer's business

Attendant circumstances such as government regulation, foreign conditions, plant locations, shipping conditions

RESULTS ANTICIPATED ON COMPLETION OF PROJECT

Direct results Expected selling price Expected Volume

% of Market taken

Advantages Temporary permanent patent by products

Specific sales-objective

Position as part of the Development Campaign

Table I

A TECHNICAL SITUATION

Name of product considered:

THE NEED

What the Customer (and market) actually desires

properties price volume

Reasons why the present product is not completely satisfactory

What special modifications of existing process the customer will make

How the customer will know he has what he desires

customers tests; end users tests; time involved;

How we will know the customer has what he desires

ATTEMPTS TO SUPPLY NEED

Other products the customer could use reasons for not using

Attempts to improve currently used products results

Why haven't other suppliers supplied the customers need

Why the customer doesn't develop the required product himself

OUR ADVANTAGE

What special product could we supply that would be more satisfactory than the product now in use

How the new product would circumvent the disadvantages of the product now in use

Special sales effort or special equipment required

Would the new product be in the direction of our expansion trend

Table II

toward limited, clearly understood objectives, usually one at a time.

Development work is invariably based on the joint action of many individuals; it does not naturally come from one person. A single man or a few men, on occasion, can approach an objective by jumps, but where many men are needed to accomplish an objective, we march toward it in short steps.

Selecting Projects

MANY projects come up for consideration by a development department. The number of projects submitted for consideration are much greater than those that can be done, so that the most promising projects must be sorted out. Understanding the importance of sorting is a recognition that a campaign cannot be a continuous series of skirmishes but must be condensed into a few decisive battles.

This means the battles must be fought where the ground gained will be of significance. Like a good general, a research organizer repeatedly sorts information coming to him (or which he goes out to get) for symptoms indicating the directions taken by the industry. The decisive engagements (Development Projects) should be fought out on terrain best known to us and the shortest possible distance from our supply base (Research).

In this way a campaign swings with the trends in the industry and itself influences later trends.

Proceed in the sorting process as follows: Arrange each project into a standard form. The form should show at a glance estimates of—

1. Time required for project to reach profit stage.
2. Anticipated net return in dollars.
3. Percentage of present business involved
4. Expenditures — financial, manpower, equipment
5. Estimated chance for success.

Then sort the projects into groups — such as

The Most Profitable — in net profits — in terms of expenditures

The Shortest Term

The Most permanent advantage

The lowest expenditure required

Select those that fit into your available fund of time, money, men.

Now, provided you have used realistic data, you can evolve a reasonably accurate schedule for completing your projects and starting new ones.

Now you have a schedule for time and effort expenditures, a reason for each step you take, and a sort of assurance that you are concentrating on the most important projects.

A sorting process of this type becomes a tool for controlling Development work.

Business Environment And Development

Does "Development work" imply the same operation under all circumstances? No indeed. Chemists responsible for results are becoming more and more conscious of the particular business set-up in which they have to operate. They want to set their equipment to fulfill known requirements. Basically different development approaches are necessary due to different industrial surroundings. When modern industry integrates, multiple units become grouped into either a (1) vertical, (2) horizontal, (3) circular or (4) haphazard organization.

In a vertical organization profits derive from high production. Large volumes mean lower unit overhead costs and it is often advantageous to produce one or more of the major raw materials. Development work in this type of set-up is long term in nature and concentrated on either a few products or devoted to many derivatives of a few basic products.

In a horizontal organization profits derive from the sale of many varieties of product. Sales volume of no single material is sufficient to make it profitable to own and operate basic chemical production. Since profits are dependent on versatility in sales, emphasis is placed on Development Adaptability. Development becomes short-term and concerned with many projects. Speed in development is the watchword. The general tenor being: a development pays off when it gets out of the laboratory.

In a circular organization business arises from some "special advantage" in raw materials, process, or location. Sales to a circle of not necessarily related industries. A circular organization represents a condition of temporary advantage. Here developments aim to increase sales into ever more diversified end uses. This in turn results in a greater dilution of effort and coverage. Effective development in the midst of a circular organization calls for the extreme in maneuverability. This in turn requires high volume and effective sorting of incoming information. Managements generally operate from a reserve of completed developments and feed them into the market as required to maintain expansion of business and discourage the vertical combinations from moving in and taking away the "special advantage" and therefore the profits. Circular organization is organization that will change. Watch each step carefully for change toward either a vertical or a horizontal set-up.

A haphazard set-up comes about when a number of unrelated business units are just put together. Unified financial or business control may be in effect but it does not represent function organization. Here we see unplanned development. Since group thinking is difficult in this environment, development projects are apt to be regarded as hobbies by the management or brought in from outside. The haphazard set up either falls apart or begins to take on a form. As it orients toward the profit getting team set up, campaign type developments gradually emerge.

The pathway of an organization from a haphazard set-up to a vertical set-up has often been pointed out by a campaign type development. Development serving to guide management by example.

Preview of a Development

A PROPOSAL to start a Development Program most often comes wrapped up in a very innocent looking package. It is started something like this — "If we had xxx product for doing yyy job, it would be a good thing."

Consider the dynamite this sentence contains. It points to an unfilled need in a designated segment of the industry. It anticipates the

possibility of doing something and a profit from so doing. It gives a point in a development pattern.

An easy reply is "yes — let's see if we can do it." But between the question and the answer lies the "business evaluation of a development."

Once we have decided what is actually desired and how we will know when the job is done, we can spend some time looking at the statement "it would be a good thing." But — how good? How good from a business standpoint? How good from a technical standpoint? And we must answer another question — How bad?

Analysis of a Project

ANALYTICAL considerations on the *Position* of a project:

(a) can it possibly return development costs?

(b) is there sufficient research backing available or potentially available on this subject?

(c) does it fit in with the orderly progression of our established line of products?

(d) is it in an expanding area technically?

Analytical consideration on the business *Capacity* of a project:

(e) is it within our available and forseeable capacity for time, men, imagination, finance?

Analytical consideration on Advantage:

(f) will a permanent advantage result technically?

(g) will a permanent financial advantage result?

(h) competitive advantage?

(i) time advantage?

When our "project on trial" shows up as acceptable in this type of preliminary analysis, we are ready to make statements as to the situation at the start of a project.

The items involved in a statement of the *Commercial Situation and the Technical Situation* are shown in Table I and Table II.

Group Thinking

WHEN you make a statement of Situation at the start of a project you inform your management, sales, production of your intentions, and stake out your claim on the ground you are working in. Your statement is a step in group thinking. It allows for comment and constructive suggestion and prepares other departments for your results.

The Statement of Situation is becoming recognized as one of the new tools of the Profit-getting-Team's instruments of coordination and schedule.

Watching our Steps

DEVELOPMENT work does not necessarily depend on rigorous scientific proofs. It depends on what the customer wants and what we can do to supply him. To do this we form a scheme of relationships to account for the set of problems before us, then we fit the problems into the scheme — demonstrate parallel problems and gradually evolve a structure. Having established an anatomy or parts of structure, we *develop* missing parts and tie them into our structure.

We advance to our completed structure through the steps of—

1. Finding the job to do.
2. Finding out how to do the job.
3. Knowing how to do the job.
4. Production of the product— requiring finance, equipment, manufacturing, inventory, control, labor, etc.
5. Promotion of the product.
6. Business.

As we advance along these steps the number of people and amount of facility required to accomplish each step increases. Also as we go along, the Development Group exerts less control over the progress of events, until at the end it has no control over resultant business. Also many developments only get past one or two stages before they get impractical. As a consequence of these conditions, a Development Group keeps a number of projects active at the same time.

View of Development Operations

A view of the interior of a development group reveals certain projects in initial stages of evolution, many projects in the middle stages, a few projects in the final stage and a warehouse of other projects to be sorted evaluated and scheduled.

Our picture shows development control deploying effort and facilities to speed up or scrap lagging projects and prevent too many projects from collecting at any one stage and blocking the path of others.

In a central part of our scene stands the "publicity corps." They continuously inform management of significant findings and report actual progress compared to anticipated progress. They keep exact and current information going to all parties to enable others to plan in advance and to overcome preconceived misinformation. Then further aside the man with his foot on the brake appears. He prevents premature release of information and opinions that might not represent the real conclusion of the group.

(*Turn to page 59*)

A Forward Glance

This article completes our survey of fundamentals and background for Research and Developments as applied to the Coatings Materials Industry. We have discussed—

I The Place of Research and Development in the Industry

II Factual Information — The starting point

III Details of Research Technic — exploring and map making

IV Details of Development Technic — the product goal. Our next articles will include practical application of these outlined methods to—

Varnish and Vehicle Formulations, Varnish and Vehicle Production, Paint and Enamel Formulation, Paint and Enamel Production, and Raw Material Development for the Paint Industry.

A final series will discuss —

Management — Development Coordination, Precision Marketing Technic, and The Pulse of the Future.

Fatty Acid Requirements in Paints and Resins

By

HENRY M. ENTERLINE

Plastics and Resins Dept.

American Cyanamid Co.

IT IS indeed a pleasure and an honor to represent the Resin Industry in this discussion of "What We Are Looking for From Fatty Acid Producers". This discussion will be confined to the types of acids and specifications for them that are used by my Company and are probably representative of other resin manufacturers. All of you are well aware of the fact that we and other large resin producers desire quality and uniformity as the most important requirements in fatty acids, in order that we may obtain these same characteristics in our resins.

Types Used

Our regularly used fatty acids for resins include DD Cottonseed, DD Coconut, DD Linseed, a number of grades of Soya (ranging from prime Soya acids for very light colored resins to single distilled for resins which will meet some military specifications), a high Lauric with very low iodine value, Tall Oil, and a very low titre Soya type acid with low conjugated double bond fatty acid content. For most of these materials we have tentative specifications, and over several years have found that fatty acids which have been supplied were generally within these specifications in most characteristics. In some cases, we have bought materials on an improved sample or the supplier's specification.

As to quantities of these various fatty acids, we buy Linseed, some Coconut, and high Lauric in drums; Cottonseed and Coconut are bought in tank wagons or 4,000 gal. tank cars, and Soya, Tall oil and the Soya type in 8,000 gal. tank cars. Of these, Cottonseed, Coconut and the high Lauric type acids are used in resins for plasticizing cellulose lacquers and urea formaldehyde and melamine formaldehyde baking enamels; Linseed and some of the Soya acids in resins for air drying finishes; Tall Oil acids primarily in resins of the baking type; some of the Soya and Soya type acids are used in resins for baking finishes and also as plasticizers for the urea and melamine formaldehyde resins.

Over the past 15 years there has been an increase in the use of fatty acids in resins due to their decrease in price. Originally when the alkyd industry started, practically all fatty acids used were obtained by splitting whole oil, and then, as now, brought a premium of several cents per pound over the oil. As a result, insofar as possible, oil was used instead of acids in making resins. With the advent of good fatty acids from soap stock and their subsequent lower prices, their use in resins has increased. However, there is constant consideration of the economics of using either oil and/or acids, depending upon the relative prices and the price of glycerine. Also, with increased use of pentaerythritol, resins have been made with the whole oil by alcoholysis. Previously, to use whole oil it was necessary to use the monoglyceride process, especially in the shorter oil length resins. Since raw material costs of resins constitute 70% and up of the final selling price, the price of fatty acids is a very important factor in their increased use in resin manufacture.

Specifications and Tests

We have, for years, been working on specifications for the various types of fatty acids and our tentative specifications have been submitted to most of you for comment; some of you have stated that they are the most stringent in the industry. These specifications have included the usual characteristics; that is, initial color, acid number, saponification number, iodine value, ash content, titre and % unsaponifiable. In addition to the above, we have included our "color after heat" test, which has not been acceptable to most of you. This last test consists of actually making a resin, using 270 grams of fatty acids under test with 222 grams of phthalic anhydride and 132 grams of CP glycerine (100% basis); the melted PAA color has to be 50 APHA max. The material is heated in a 1 liter, 3 necked glass with agitation and an inert gas passing through the liquid. This is heated in approximately 3 hours to 260°C., where it is held 15 minutes and the Gardner color is taken. The greatest objection to this test by most of you has been the length of time which is required to make the test. We realize that this is perhaps not the ideal method of testing, but it is the best test that we know that actually indicates what our finished product will be like, and up to the present time, with the exception of one company, we have had no constructive criticism on the test. While it does take a long time, it should be considered that our customers who are the ultimate consumers of the resins, because of keen competition, require that we make drying tests and enamel tests, which consume much more time than the above mentioned heat test. The S & W heat test, which is used for oils and fatty acids, and consists of heating the fatty acids or oil by itself to a high temperature, has been considered but it is felt that this does not give either comparable or satisfactory results for our purpose. In the majority of cases, we can obtain conformance to all of the specification limits and in addition get satisfactory S & W and Cyanamid heat test colors. However, in a few cases, the S & W test has been satisfactory, but the acid has not passed our own heat test. We really have rejected very few lots of material because of failure to pass our heat test. The initial color of the fatty acid does not give us what we want, since any impurities, such as metals, etc., would not show up in the original color, but might have quite a darkening effect when the resin is made. Therefore, we would welcome any constructive criticism on this heat test or suggestion of any other test that will determine the color that can be obtained in actual production.

The methods of analysis used for other characteristics are standard; that is, initial color — Gardner 1933 Color Scale; acid number — by direct caustic titration; saponification number — with alcoholic potassium hydroxide; iodine value — WIJS method; titre — standard AOCS, and we are now using for % unsaponifiable the AOCS official method Ca 6b-40. We have previously used the ASTM method for unsaponifiable, but found that the results varied so much that we have adopted the AOCS method which we believe is more generally used.

It is felt that the greater the number of tests for these materials, the more leniency there can be on any particular one. In certain cases, we have found that while we set a limit for a certain characteristic, we could actually use a material which might be either higher or lower than we thought in that characteristic. As a result, the more comments and criticisms we can get from you on our tentative specifications, the easier we believe it will be for everyone. In other words, what we are most interested in is how we are to reconcile our choice of iodine value, acid value, etc., ranges, which are based upon our evaluation of satisfactory materials, with the ranges for these items published by our various suppliers. We also believe that there is a trend away from pure chemical analysis to actual performance tests.

Properties Desired

Some of the properties and characteristics of resins for which improvement is always hoped for through the use of better fatty acids include color and color retention; gloss and gloss retention; adhesion, especially in combination with lacquers and amino resins; drying speed; flexibility, hardness, toughness and mar resistance; acid, alkali and water resistance; and compatibility with other resins. Fatty acids with high linoleic and very low linolenic content, i.e., similar to safflower acids, should give very excellent drying, color and gloss. Acids which give the good characteristics of tung oil, i.e., drying, hardness and resistance without the objectionable features, poor color and double bond conjugation, would be very desirable. And acids which can be used to further improve styrenated alkyds will be very welcome since this type resin has definitely established itself because of excellent characteristics. And certainly the rapidly expanding vinyl resin industry can use new alkyd plasticizers.

There has always been close cooperation between our two industries and the technical aid given by the fatty acid producers has been appreciated; but there is still room for additional cooperation with technical aid on the development of specifications that will assure improved products and increased use. . . . .We feel that we have good specifications for today — let's not wait until tomorrow for their acceptance and use.

Presented at the Fatty Acid Div. Meeting of 25th Convention of the Association of American Soap & Glycerine Producers on Jan. 21, 1952, Sewall Andrews of General Mills, Inc., moderator.

Now...protect your

outside whites against cracking

this lower-cost way

Dutch Boy* **Basic Silicate White Lead "45X"**

"lead" at its efficient, economical best

It's lead soaps that do it...

Lead soaps give a paint film the distensibility and flexibility needed to prevent cracking and scaling under the stresses set up by varying thermal and humidity conditions.

And to form these soaps, you now have a pigment that's more economical and efficient than any other type of "lead": "Dutch Boy" Basic Silicate White Lead "45 X".

This latest development in white lead concentrates the reactive portion of each pigment particle at the surface. Thus, it makes available proportionately larger amounts of "lead".

You use fewer pounds, too

That's because 60 to 63 weight units of "Dutch Boy" Basic Silicate White Lead "45 X" equal in volume 100 weight units of standard white lead types.

Many leading paint manufacturers are reducing costs, without sacrificing quality, by using "Dutch Boy" Basic Silicate White Lead "45 X" in their outside white formulations. Try it yourself.

NATIONAL LEAD COMPANY: New York 6; Atlanta; Buffalo 3, Chicago 8; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.).

*Reg. U. S. Pat. Off.

Struggling

OVER YOUR CASTOR OIL QUOTA

try the NEW, PROVEN CYCOPOL® S 203-5, a non-castor styrenated alkyd resin

This new CYCOPOL Resin offers you three timely advantages.

First, CYCOPOL S 203-5 contains no castor oil.

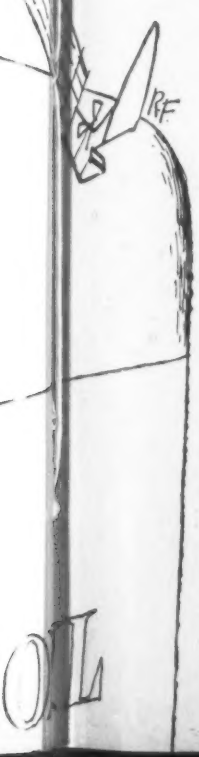
Second, CYCOPOL S 203-5 can be used as the sole vehicle for Military Specification MIL-E-10687 (ORD), eliminating the need for stocking two different resins for a single formulation, thus easing inventory problems.

Third, CYCOPOL S 203-5 permits reduction with high proportions of aliphatic solvents.

While CYCOPOL Resin S 203-5 was developed especially for Military Specification MIL-E-10687 (ORD), its properties suggest its use in a variety of air drying and baking applications. Finishes produced with this new resin combine rapid-drying characteristics, excellent color, gloss and valuable film properties.

Paint manufacturers approved on MIL-E-10687 (ORD) with castor oil resins prior to June 25, 1951, may resubmit samples to the Aberdeen Ordnance Corps Paint & Chemical Laboratory with the non-castor CYCOPOL S 203-5 without charge.

Write today for samples, or more data.



COATING RESINS DEPARTMENT

30 Rockefeller Plaza, New York 20, N. Y.

Controlling Vibration in Paint Machinery

By
FULLER ROSS

ALONG WITH man-power problems, the rate of production per man hour, the paint industry today must likewise confront that of getting the utmost out of "machine hours" and this entails at least remedying a ten per cent loss of potential energy and machine performance through equipment vibration.

Only in recent years has the true picture of such loss through vibration transmission and the realization that correctives are possible, been realized among paint making equipment users. Reliable estimates based upon careful tests and studies reveal a somewhat surprising tally of "costs" due to vibration, inherent to a more or less extent in nearly every type of machinery used in the paint field today. Such correctives now:

a. Save on the structure's maintenance cost. With proper isolation of machinery, the building foundation need be less thick and much less costly to lay. Also true of the upper floors.
b. Bring greater all around operating efficiency.
c. Add to the employees' safety margin and tend to protect workers' health.
d. Greatly increase power output per unit.
e. Reduce maintenance costs by having fewer replacements of wearable machinery parts — such as dies, bearings, cutters, etc.

The fact is that nearly any piece of paint machinery may show a reduction in *potential* output of from ten to twelve per cent, and even more, unless proper correctives are applied to offset these tendencies; and this vibration which is, in effect, useful and usable energy, finds its terminus in the foundation of the building on the ground below. The effect of this waste, it will be easily recognized, is to put a tremendous extra useless "load" on the power equipment "plant" at a time when every effort is being strained to produce more power, to produce it faster, and to produce it better in both defense and civilian fields.

Year by year remarkable progress is revealed in eliminating machine vibration and the topic is of direct and special interest to the makers and users of paint machinery just at this time. Tests and studies have proved that the proper and scientific isolation of machinery to prevent the transmission of vibration has become one of the really important phases of modern engineering.

In an interview with this writer, Mr. B. A. Doane of the Vibration Elimination Company, pioneers in this field, said:

"Because concrete, steel, and other building materials are all conductors of vibration, all mechanical equipment should be isolated. Properly planned isolation acts not only as a shield to prevent vibration transmission to the foundation, floor, the building structure and surrounding equipment, but it also materially reduces dynamic bearing loads.

"When any machine is rigidly mounted upon a solid support or foundation, vibration loads are added to the normal operating loads. These combined loads are frequently of such magnitude as to definitely increase the wear of moving parts. The cushioning effect of isolation permits all parts to operate freely, with a resulting reduction in wear.

"Effective isolation is not the mere interposition of a resilient material or system. Incorrectly applied isolation may even aggravate

the vibratory condition. To be of any value the isolation material or system must be resilient under the condition of installation; that is, under the impact of operation, it must have a certain predetermined action.

"Briefly, if the isolation system is under-loaded it cannot be resilient. Its reaction will be the same as that of a solid mass, and it will transmit vibration. At the other extreme, if the isolation system is overloaded, fatigue results, with a complete breakdown of the resiliency factors. It is clear to the trained engineer, therefore, that the isolation material must be properly loaded for maximum isolation efficiency. Isolation cannot be purchased by measuring the base or foundation and ordering so many square feet. In practically every instance the isolation material will be definitely underloaded and virtually useless."

Example of integral treatment.

Vibration Eliminators

OF course, it is a well known fact in the paint machinery field that a blanket recommendation for isolating any and all types of machinery is impracticable. Yet, as has been pointed out, each job doesn't necessarily have to be a "tailored" one thanks to improvements in modern methods of isolation. The present wide selection of unit isolators brings to the machinery manufacturer or user a choice of vibration eliminators all designed to remedy that most common factor — "underloading". Not only do these modern isolation units make it possible to "control" the load, but their installation is an extremely simple matter under proper supervision, based upon experience.

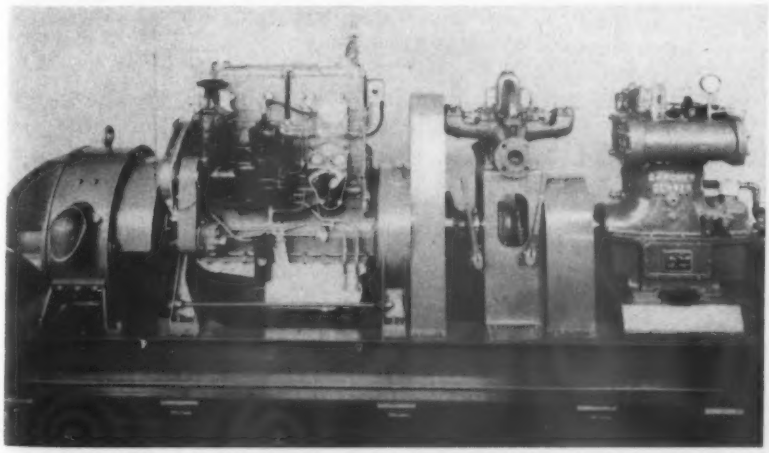
To a great extent rubber has become the basic factor in designing and building the new range of vibration isolators which today can be adapted to meet any need. It should be remembered, however, that rubber does not have elasticity by *volume*. For this reason, rubber under compression evidences resiliency only by bulge around the edges, and is limited in use as a vibration eliminator. However, the vibration isolation engineer today utilizes the full advantage of the natural elasticity of rubber by employing moulded rubber or rubber bonded to metal both having cross sections that permit them to act freely in shear. This same principle of rubber-in-shear has been used to develop a variety of unit isolators having provisions that permit bolting to a machine and also the supporting structure.

Problems of resiliently supporting small loads ranging from a few ounces to several pounds present difficulties not found in handling heavier loads. In overcoming these difficulties, no isolation material has proven more effective than rubber. Because of this effectiveness, isolation engineers have developed a wide variety of designs using rubber-in-shear for resiliency and rubber in compression for stability, thus enabling the application design engineer to consider the particular problems of installation when selecting the units for the job.

The application or adaptation of these standard units and the conception of a new designs for special paint manufacturers jobs is a large part of vibration isolation engineering today, and eliminates the possibility of over-looking local conditions peculiar to a specific job, which exist when an attempt is made to select mountings from a catalog.

Cork, too, has its place in modern

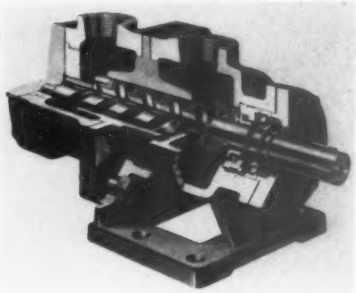
(*Turn to Page 58*)



Typical diesel isolation treatment.

NEW PRODUCTS & IMPROVEMENTS

A MONTHLY MARKET SURVEY



DE LAVAL

ROTARY PUMP

For High Pressures

This pump is said to save up to 40% in initial cost over other IMO models for similar pressures. This IMO is designed to handle a wide variety of oil handling applications for pressures up to 275 psi.

This new rotary positive displacement pump offers all the advantages of the IMO design. It has only three moving parts. It is reliable, quiet, pulsation-free, compact, excellent for high-speed operation, according to the manufacturer. It can be used for capacities to 80 gpm, pressures to 275 psi and intermittent pressures up to 325 psi.

Bulletin L313B, which fully describes this new IMO pump, is available on request from the De Laval Steam Turbine Company, Trenton, N. J. —PVP—February.

ACRYLIC THICKENERS

For Resin Latices

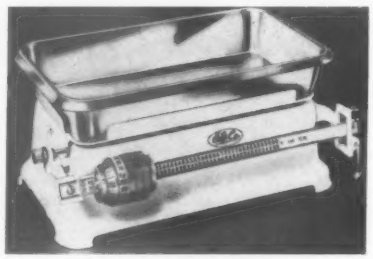
Polyco 296BT and Polyco 296N, high and medium viscosity grades respectively of sodium polyacrylate, are recommended as stabilizers, protective colloids, and thickeners for synthetic rubber and resin latices. They are said to possess adhesive, suspending, emulsifying and film forming characteristics. American Polymer Corp., Peabody, Mass. PVP—February.

ONE-PAN BALANCE

Exact Weighings

One-Pan Beranger Balance is especially designed to provide fast, accurate weighings for all rough laboratory weighings.

This Balance features a unique new precision mechanism that employs no loose weights. There is only one beam weight to manipulate. This weight is moved along the beam until balance is brought into rough equilibrium. Final adjustment is made on the micrometer, which is an integral part of the beam weight. It is then only necessary to read the kilos and grams, clearly marked on the beam and add the micrometer reading for the total weight. Emil Greiner Co., 20-26 N. Moore St., New York 13, N. Y. PVP—February.



GREINER

STAINLESS TOPS

For Lab Furniture

Stainless steel tops for laboratory furniture are now offered by Fisher Scientific Company. The tops are manufactured in Fisher shops to fit basic models of Unitized laboratory furniture, sold exclusively by Fisher's five plants.

Each top, supported by thick plywood sections, is made in one piece with an integral splashback and reagent shelf. Stainless steel used in the new tops contains over 30% non-ferrous alloying materials, making it highly resistant to the action of common laboratory reagents. Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pa. PVP —February.

MODIFIED OIL

Castor Substitute

Known as "Kelcastoil," this new product has many of the physical properties of castor oil. This material is a modified vegetable oil, having the same viscosity as castor. It is non-drying, has a light amber color, and is soluble in methyl and ethyl alcohols. Spencer Kellog & Sons, 98 Delaware Ave., Buffalo 5, N. Y. PVP—February.

ROTARY PUMPS

Heavy-Duty

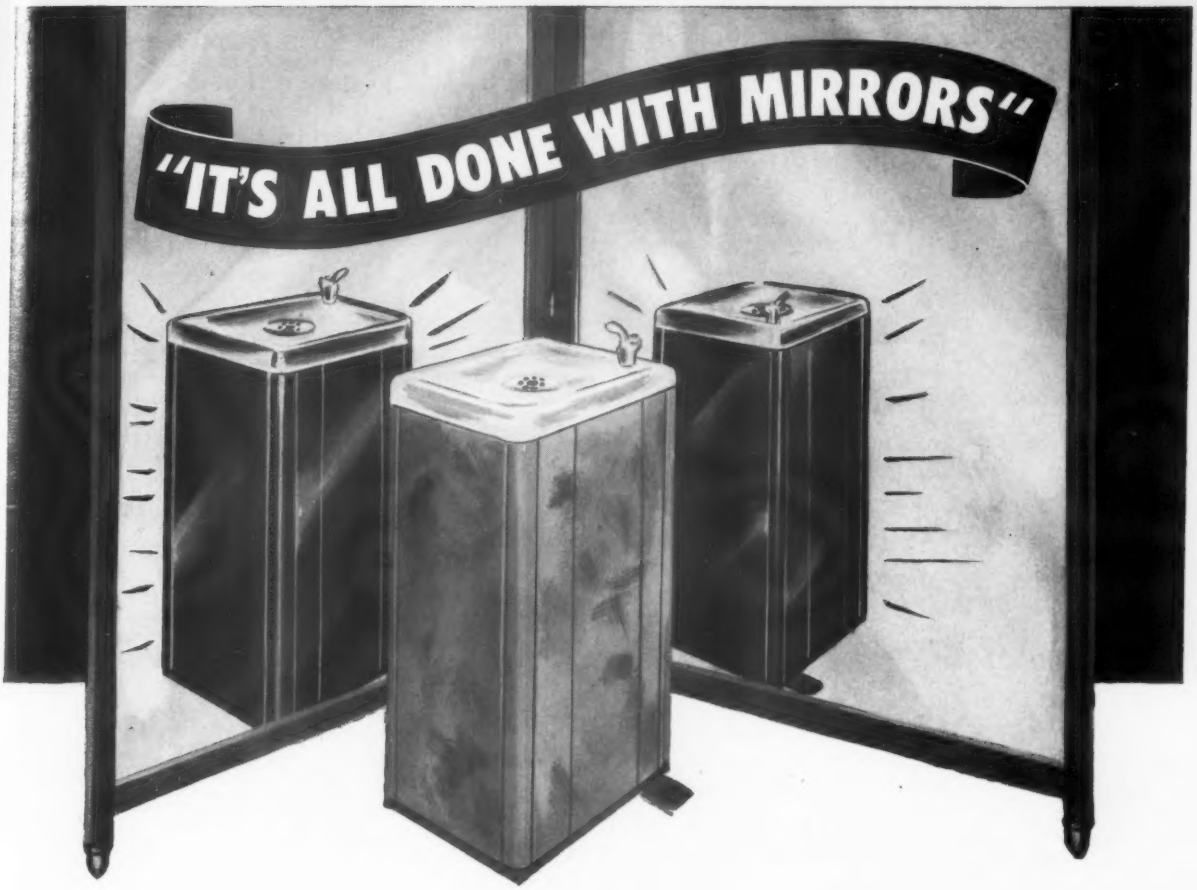
All models are positive-displaceerpnt, sliding-vane type in which messure of the liquid being pumped maintains contact of vanes against liner. Pumps have built-in relief valves and can be made bronze fitted or all bronze, if desired. Worthington Pump and Machinery Corp., Harrison, N. J. PVP—February.

VINYL RESINS

Custom-Made

Vinyl acetate copolymers, custom-made to meet the user's own requirements have potential application in adhesive formulations, heat-sealing coatings, laminations, gloss coatings for paper, greaseproof coatings, high solids lacquers, and protective coatings requiring good adhesion.

The new resin solutions are said to give improved adhesion to a wide variety of difficult surfaces. They can be supplied in a range of molecular weights, in various solvents, in concentrations ranging from low to unusually high solids content, with either increased or decreased residual tack. National Adhesive Div., National Starch Products, 270 Madison Ave., New York, N. Y. PVP-February.



Why TITANOX pigments are especially useful for industrial paints and finishes

This familiar explanation of magic tricks closely parallels the "magic" of the opacity and brightness of TITANOX pigments in industrial finishes. In a sense, TITANOX covers surface blemishes and imperfections "with mirrors".

Titanium dioxide has an extremely high index of refraction — higher than any other white pigment, higher even than diamonds. When light strikes a paint film it will go through and show up the background, if the pigment particles have the same refractive index as the paint vehicle. However, if the pigment particles have a high index of refraction and are of the right size — as TITANOX pigments are — the light is reflected at every interface, and the background is hidden.

In effect, the TITANOX particles are like millions of tiny mirrors which prevent the light from reaching the background. That's how TITANOX pigmented industrial paints and finishes — especially those using the rutile TITANOX-RA and TITANOX-RA-NC—give high quality films without excessive pigmentation.

Our Technical Service Department will be happy to consult with you on your industrial paints or finishes problems. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

9732

® TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

NEW PRODUCTS

PANGBORN

DUST COLLECTOR

Low Cost

Cloth-bag collects dusts such as carbon black, cork, fine wood, graphite, pigments, lime, lamp black, soap, metal oxides and other dusts with similar characteristics. Simplified design of filter bags and mechanism for reclaiming dust from the bags, provides dust control at low equipment and installation cost, according to the manufacturer.

In order to satisfy dust collection requirements, these cloth-bag dust collectors range from 5 to 40 feet long, contain 1,360 to 10,880 square feet of filter cloth, employ from one to six hoppers, and are supplied with the appropriate structural supports to furnish the type of disposal desired — wheel-barrow, car, truck, etc.

For additional information write to the Pangborn Corporation, Hagerstown, Md. PVP—February.

MODIFIED ALKYD

Alkali Resistant

Alkyd-modified, triazine-formaldehyde resin, designated as Uformite M-311, is reported to combine a number of significant properties difficult to obtain in a single resin.

Uformite M-311 imparts to enamel formulations the outstanding features of high gloss, fast curing speed, high soap, alkali, hot water, and humidity resistance, together with excellent color retention and film uniformity. It combines the properties needed for production of highest quality white baking enamel for washing machines, refrigerators, stoves, kitchen cabinets, and similar appliances and equipment.

Uformite M-311 is a triazine-formaldehyde resin, modified with a non-drying alkyd resin. It is supplied at approximately 50% solids, on a solid basis. It contains 60% nitrogenous resin and 40% alkyd.

Uformite M-311 is compatible with short oil alkyds of the oxidizing and non-oxidizing types generally used in white baking enamel formulations such as Duraplex A-27, A-29, ND-77B, and ND-78. It has only limited compatibility with medium oil alkyds and is incompatible with long oil alkyds. It is compatible in all proportions with other amine resins. Test samples of Uformite M-311 together with technical data are available by writing to the Rohm & Haas Company, Resinous Products Division, Washington Square, Philadelphia 5, Pennsylvania. PVP—February.

WAX SUBSTITUTE

Self-Emulsifying

This wax duplicates Japan wax in all characteristics. It offers the property of self-emulsification — a lasting emulsification can be made by merely melting the wax and adding hot water. Concord Chemical Co., Moorestown, N. J. PVP—February.

REGARDLESS OF YOUR POLYOL (polyhydric alcohol) requirements for the present or the future . . . you can meet most of them with sorbitol from Atlas at a low, stable price!

Atlas sorbitol is not affected by raw material shortages, war, or wild price fluctuations. It is derived from an almost inexhaustible supply of sugar!

Sorbitol and other related Atlas polyols . . . members of the same chemical family as glycerin and the glycols . . . are *not* substitutes. In fact, they possess unique and outstanding qualities that make them superior to all other conditioners for many purposes.

Sorbitol offers you demonstrated advantages in the synthesis of hard gums, "in situ" varnishes, tall oil esters, alkyd resins. Sorbitol-based vehicles give you the range of control you want on melting points, viscosities, solubilities in your maleic and phenolic modified resin esters. And Atlas sorbitol is a polyol of outstanding purity and color.

Write for the 27-page Technical Bulletin, "Atlas Sorbitol in Protective and Decorative Finishes."

ATLAS

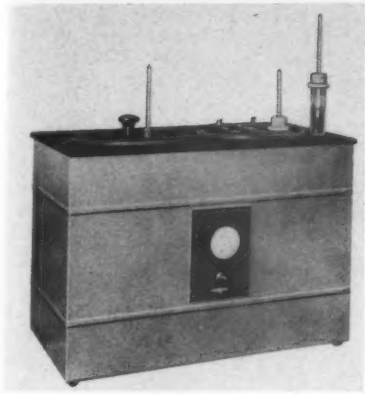
Industrial Chemicals Department

ATLAS POWDER COMPANY

WILMINGTON 99, DELAWARE · OFFICES IN PRINCIPAL CITIES

ATLAS POWDER COMPANY, CANADA, LTD., BRANTFORD, CANADA

NEW PRODUCTS



PRECISION

REDESIGNED BATH

For Cloud & Pour Tests

Redesigned ("Frigstat)" bath provides frost-free, efficient operation with a minimum of temperature control adjustments. Designed expressly for following A.S.T.M. Method D97, the bath, although manually operated, can easily be maintained within ± 2°F.

The 7-unit test chamber and the dry ice chamber are insulated with 2½" of glass wool at the sides and bottom. Cooling medium is circulated in the test chamber through coils which do not allow interchange of fluid between chambers. Dry ice capacity is ample. A full charge of dry ice plus the efficient ¼ H.P. pump will reduce temperature of the test chamber to −90°F in about one-half hour. Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill. PVP—February.

VISCOSIMETER

1 to 150 Centipoise Range

Fann V-G meter measures the force needed to balance torque applied to freely rotating cylinder in the material being tested while this material is being spun. It tests viscosities from 1 to 150 centipoise, or gel strengths up to 200 grams. Power supply of six volts can be met with an ordinary automobile battery. Instrument is portable. Geophysical Machine Works, Box 6101, Houston, Texas. PVP—February.

GRINDING LIQUID

Wide Compatibility

Grinding liquid S1190 is recommended as a grinding vehicle for concentrated colors used in shading and tinting. It is a low viscosity, high solids alkyd resin solution designed specifically for a wide range of compatibilities.

The new S1190 solution is said to be compatible with oils; bodied oils; long, medium and short oil alkyds and varnishes. When used in tinting quantities, it is compatible also with styrenated alkyds, ureas, and melamines. It is claimed to have excellent pigment wetting properties. Pigments can be ground with ease on roller mills, stone mills or in ball mills.

No signs of livering or skinning could be noted in a partially filled can of this concentrated grind after standing for more than six months.

Complete information on this new development may be had by writing direct to the manufacturer, the Alkydol Laboratories, Inc., 3242 South 50th Ave., Cicero 50, Illinois. PVP—February.

Announcing
NEVSOLV
.. a group of aromatic Petroleum Solvents
NEVSOLV aromatic Petroleum Solvents are available in a number of different distillation ranges from low boiling to high boiling. In addition to the standard distillation ranges, we invite inquiry on special fractions to meet your particular requirements. NEVSOLV Solvents are manufactured to rigid specifications, insuring high solvent power, constant evaporation rates and negligible residue.
Write for samples and further information on these uniform Neville solvents.
THE NEVILLE COMPANY
PITTSBURGH 25, PA.
Plants at Neville Island, Pa., and Anaheim, Cal.
Part of Neville's current expansion program is this new plant recently completed at Neville Island, for the production of NEVSOLV Solvents
NEVILLE
INDUSTRIES
A-43

NEWS DIGEST

Raymond C. Gaugler

American-Marietta Technical Conference. Left to Right: D. Eichelberger, R. L. Oughton, Dr. E. W. Scripture, E. Spoerry, Jr., R. Pflaumer, K. Clarke, W. Jeppson, R. Hemingway, Dr. D. Gans.

R. C. Gaugler, Pres. Of American Cyanamid Dies

Mr. Raymond C. Gaugler, president of American Cyanamid Co. recently died as a result of a cerebral hemorrage. He was 59 years of age.

Before joining the Cyanamid organization, he was with the United States Aluminum Company in New Kensington, Pa. and the Northern Aluminum Company, Shawinigan Falls, Canada. Mr. Gaugler, who had been with Cyanamid since 1917, served as Assistant Treasurer and Comptroller, and was named Treasurer in 1929. In 1939, he became Vice President in charge of finance; in 1947, Executive Vice President. He was elected President January 5, 1951, succeeding the late W. B. Bell. Mr. Gaugler has been a Director of Cyanamid since 1929.

During his many years with Cyanamid, Mr. Gaugler played a most important part in the broad diversification program, including the great strides made in recent years in the field of pharmaceuticals, biologicals, and antibiotics, which has brought the Company to a position of leadership in the chemical and drug industry.

•

Hercules Names Beaver Tech. Representative in Cincinnati

Frank W. Beavers, formerly of the department's Cleveland office, is now the technical representative in Hercules' Cincinnati office. Synthetics also have warehouse facilities in Cincinnati in addition to their present warehouse facilities in Louisville, Kentucky. The new sales office is located in Carew Tower.

Technical Personnel of A-M Hold Three Day Conference

"Watch inventories of raw materials; keep careful check on them" H. J. Hemingway, president of American-Marietta Company, told technical personnel of the A-M divisions and subsidiaries who met for three days at The Arco Company, Cleveland, Ohio recently.

Mr. Hemingway spoke at the close of a series of general and group meetings in the Arco lab and office buildings in which new scientific developments were discussed, and information on lab and production problems were exchanged. Special attention was paid to government specification formulation and industrial enamels.

The meeting is one of a yearly series, conducted by American-Marietta, and held at the plant of a different affiliate each year. It enables each subsidiary or division to keep informed of the advances made by other A-M units during the year.

The meeting was held under the direction of R. E. Pflaumer, technical vice-president of A-M. More than 65 persons attended.

Newark College Announces Annual Series on Paint Technology

The Newark College of Engineering, in co-operation with the New York Paint, Varnish and Lacquer Association and the New York Paint and Varnish Production Club, has announced that the tenth annual series of evening conferences on different phases of the paint, varnish and lacquer industry will begin on February 4. Professor Frederick W. Bauder of NCE's Chemistry Department is the co-ordinator of the series.

Courses on The Technology of Paint, Varnish, and Lacquer and The Chemistry of Synthetic Resins and High Polymers will be held in Eberhardt Hall, and a course on Basic Coatings Laboratory Procedures will be offered at the Arthur L. Mullaly Memorial Coatings Laboratory. This laboratory was given to NCE last fall by Mrs. Mary B. Mullaly in memory of her husband, a pioneer in the field of coatings chemistry.

Lecturers for the series will be representative of the paint industry throughout the United States. Professor Frederick W. Bauder, R. A. Galsibet, George S. Cook, Dr. J. D. D'Ianni, Edwin Gallagher, F. S. Greenwald, Dr. Donald S. Herr, Dr. Calvin A. Knauss, Gerry P. Mack, Louis A. Melsheimer, Dr. Vincent C. Meunier, Dr. Lyde S. Pratt, Harold Shakespeare, and Robert Terrill will comprise the list of speakers.

During the nine previous sessions of the courses, more than 600 technical personnel of paint, varnish, and lacquer manufacturers and related industries have received certificates for completing these conferences.

•

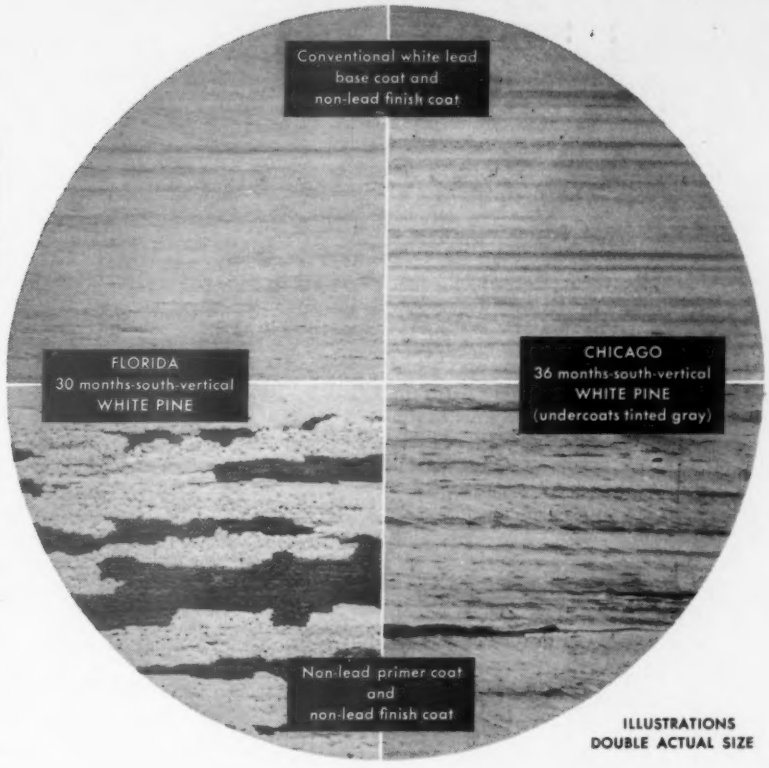
Baker Castor Oil Company Appoints Thompson-Hayward

Thompson-Hayward Chemical Company of Minneapolis is now exclusive sales agents in Minnesota and the Twin Cities for all products of The Baker Castor Oil Company.

"LEAD" in Primer Paints

improves adhesion, stabilizes, plasticizes, and controls oil penetration.

TWO SEVERE TESTS



ILLUSTRATIONS DOUBLE ACTUAL SIZE

Here's picture-proof of how "leaded" primer coats have greater staying power. The comparison of the white lead mixed pigment primer applied under a lead-free finish coat; and the lead-free paint, self-primed, emphasizes the superior performance of the "lead" primer. (Primers in Chicago exposure were tinted gray to highlight any topcoat erosion).

White lead's ability to stabilize and plasticize the film, to strengthen paint and to help it retain the optimum amount of oil explains why white lead primers withstand severe climatic conditions.

Chicago's industrial gases and rapid temperature changes, as well as Florida's moisture and sun-bake treatment, failed to permeate or crack the protective film of the white lead mixed-pigment primer—even though the non-lead finish coat showed rapid chalking and erosion that a conventional "lead" finish would have prevented. *Conclusive* proof of the tough, protective film that white lead gives to base coats.

That's why paint manufacturers offer their lead-pigmented paints with the assurance of longer staying power. For detailed information on the most effective use of "lead" in your paints – write for "White Lead in Mixed Pigment House Paints" and "White Lead Technical Bulletin #1." *Lead Industries Association, 420 Lexington Ave., New York 17.*

"LEAD" LENGTHENS THE LIFE OF PAINT BECAUSE:

It Stabilizes . . . neutralizes acidic compounds resulting from the decomposition of the vehicle—prevents the film from becoming soft or liquifying.

It Plasticizes . . . forms lead soaps which increase film flexibility.

It Strengthens . . . flexible, spiny, lead-soap particles mechanically reinforce the film and increase elastic strength.

It Resists Water . . . paint films with an optimum, lead-pigment content absorb only a small fraction as much water as do lead-free paints.

It Limits Oil Penetration . . . more of the vehicle remains in the film where it is needed; less is absorbed in the substrata.

It Improves Appearance . . . by controlling chalking and inhibiting mildew.

1565

Construction Begins on Borden's New Phila. Lab.

Construction work on a new research laboratory for Borden's chemical division has begun in Philadelphia. The laboratory will be housed in a one-story building and will have a floor space of about 11,000 sq. feet.

Research emphasis will be on development of new technics and chemical products such as synthetic resins, coatings and binders.

Heyden Begins Production Of Resorcinol at Garfield

Heyden Chemical Corporation has begun production of resorcinol at the rate of 600,000 lbs. a year at its Garfield, N. J., Division plant which has been rebuilt with doubled production capacity since it was partially destroyed by fire last February.

Resorcinol, an essential ingredient in waterproof glue and adhesives for wood, in resins for rubber and tire cord sizing and many other products urgently needed for defense purposes, is one of the few chemicals still on allocation by the National Production Authority. The Koppers Company and Heyden are the only producers of this important chemical in America at this time.

Dr. Charles E. Reed

G-E Forms Silicone Products Department

The formation of a new General Electric Company Chemical Division product department to be known as the Silicone Products Department has been announced by Robert L. Gibson, general manager of the Division. Simultaneously it was announced by Mr. Gibson that Dr. Charles E. Reed, engineering manager of the Chemical Division, has been named general manager of the newly formed department.

With the formation of the Silicone Products Department, having headquarters in Waterford, N. Y., the G-E Chemical Division is now made up of four product departments, the other three being Plastics, Chemical Materials, and Laminated and Insulating Products.

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New England Paint Course Announced

Paint courses conducted by the New England Paint Salesmen's Club will be given at M.I.T. on the following dates.

I. Feb. 13 — Preface and outline of the course by the course leader, Herbert L. Collins (first half-hour), followed by an hour lecture on Classification of Paint and Its Uses.

II. Feb. 20 — Preparation and Painting of Interior Surfaces.

III. Feb. 27 — Preparation and Painting of Exterior Surfaces.

IV. March 5 — Tools-Rigging, Estimating Spray Brush, Roller.

V. March 12 — Paint Failures and Remedies.

VI. March 19 — Fundamentals of Color Styling in the Home.

VII. March 26 — Color Harmony-Industrial and Institutional.

VIII. April 2 — New Merchandising Trends.

HERE IT IS!

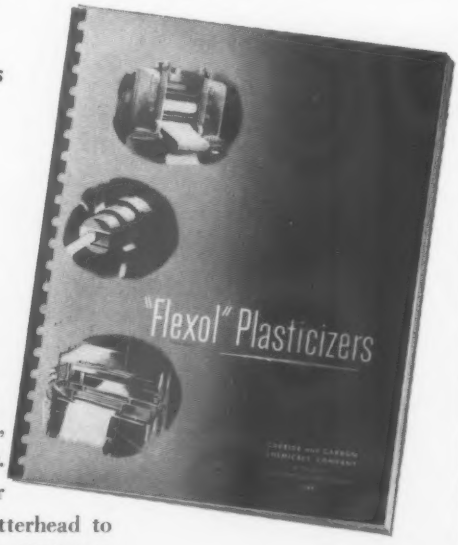
. . . the new FLEXOL plasticizers catalog

Trade-Mark

Seventy-six pages of valuable information on the twelve FLEXOL plasticizers that will help you formulate better plastic products.

Also separate detailed sections on . . .

- VINYL DISPERSIONS
- NITROCELLULOSE LACQUERS
- SYNTHETIC RUBBERS
- PLASTICIZER EMULSIONS



If you use plasticizers in any way, shape, or form, get your copy *now*. There's no charge!—simply call or drop a note on your company letterhead to the nearest CARBIDE office—ask for F-5882A.

CARBIDE AND CARBON CHEMICALS COMPANY
A Division of
Union Carbide and Carbon Corporation
UCC

30 E. 42nd St., New York 17, N. Y. Offices in Principal Cities
In Canada: Carbide and Carbon Chemicals, Limited, Toronto

"Flexol" is a registered trade-mark of Union Carbide and Carbon Corporation.

Fred J. Stickle

F. Stickle Named Eastern Mgr. Of Cyanamid Coating Resins

Appointment of Fred J. Stickle as Eastern Regional Sales Manager of the Coating Resins Department was announced by American Cyanamid Company. Mr. Stickle, formerly a technical sales representative, will supervise sales and sales promotion of Coating Resins in the Boston, New York and Philadelphia areas.

•

Paint Industry Technical Meeting

A number of metallic pigments and other paint ingredients are now in improved-to-fair supply, it was agreed at a recent meeting of the Paint Industry Technical Committee with the National Production Authority, U. S. Department of Commerce.

The improved supply is due largely to a recent falling off in Government procurement and other demands. Industry representatives emphasized that the continuation of the currently improved supply situation is entirely dependent on future demands of Government agencies for paint or raw material supplies.

The meeting was called to discuss the possibility of preparing emergency Government paint specifications should shortages of either pigments or other paint ingredients develop and thus require the conservation of materials used in the manufacture of paints.

In slightly improved supply at present are: Lead oxide and lead bicarbonate; and in fair supply, zinc oxide, zinc chromate and bichromates. New sources of production have increased supplies of formaldehyde and pentaerythritol. Supplies of phthallic anhydride, however, are still tight.

Because lead is in demand for a number of defense and civilian uses, the committee recommended that Government purchasing agencies use a low lead or leaded zinc oxide specification instead of a Government specification with a high lead content.

A General Services Administration representative said his agency had found that specifications for certain tung oil and phenolic resin varnishes and floor sealer coatings might be modified to reduce or eliminate the amounts of these ingredients without affecting the covering qualities of the coatings for some uses.

Committee members agreed to study various Government paint specifications and also develop suitable data for emergency specifications for testing and possible use.

Dr. Willem A. Nyland, of NPA's Chemical Division, presided.

•

New Tall Oil Distillation Unit For W. Va. Pulp

A new tall oil deodorizing unit incorporating improved design features to give a higher quality product has been successfully put in operation at the Covington, Virginia, Tall Oil Plant of West Virginia Pulp and Paper Company.

Designed and erected by the Rust Process Design Company of Pittsburgh, the new unit has improved the quality of the tall oil product thru a higher refinement by means of advanced technique in vacuum distillation.

Synthetic PICCOLASTIC Resins

STYRENE, SUBSTITUTED STYRENE AND HOMOLOGUES

with properties especially valuable for

PAINTS
VARNISHES
ENAMELS

Piccolastic resins comprise a wide assortment of melting points, molecular weights, solvencies and other properties. They are permanently thermoplastic, and are soluble in aromatic hydrocarbons.

Write for bulletin giving description and properties of each type. We will be glad to send samples for your examination and test. Please specify the application so that we may send suitable grade.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.
Clairton, Pennsylvania

Plants at: Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

Distributed by Pennsylvania Falk Chemical Co., Pittsburgh 30, Pa.

TODAY'S FORECAST

Fair and Warmer, Rain and Cooler, Brilliant Sun, Heavy Overcast . . . . . .

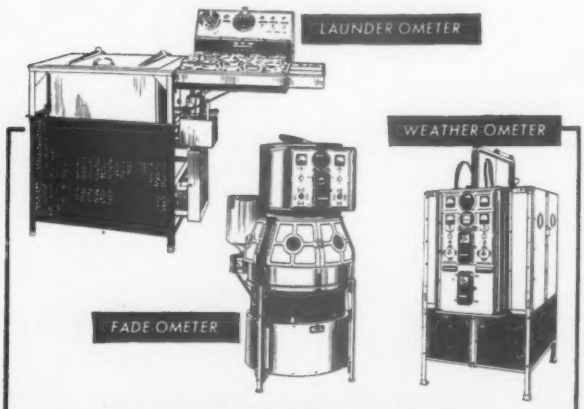
You get them all in an Atlas Weather-Ometer

Perhaps you've never seen a forecast like the one above. But, if you manufacture products for use out-of-doors you'd probably like to, because it's just the kind of weather that can "prove" your products in a hurry.

An Atlas Weather-Ometer can't actually change the weather for you, but it *can* reproduce the type of weather you want—right in your laboratory. Products react just as they would under actual exposure, but because Weather-Ometers work on a 24-hour day, the rate of deterioration is multiplied by as much as 25 times.

With its Atlas Sunshine Carbon Arcs, the Weather-Ometer gives you the most accurate duplication of natural sunlight possible. Then, according to your specifications, it will provide high temperatures, thermal shock, high humidity, rain, or dry periods without sunlight. Most important, the Weather-Ometer gives you complete control over the sequence and duration of these cycles.

Whatever your product, if it is to be used out-of-doors, it should be tested in a Weather-Ometer. The machines are simple to operate and can be left running without attention from the operator except to change carbons.



ATLAS ELECTRIC DEVICES COMPANY

361 W. Superior St., Chicago 10, Illinois

Manufacturers of accelerated testing devices for more than a quarter of a century

CALENDAR OF EVENTS

Mar. 3-7. Spring Meeting of ASTM, Hotel Statler, Cleveland.

Mar. 6-7. Spring Meeting of the Southern Paint and Varnish Production Club, Buena Vista Hotel, Biloxi, Miss.

Mar. 10-14. Annual Conference of the National Association of Corrosion Engineers, Buccaneer Hotel, Galveston, Tex.

Mar. 31-April 1. ACS, Div. of Paint, Varnish and Plastics Chemistry, Spring Meeting, Milwaukee, Wis.

April 3-5. First Pacific Coast Paint Material and Equipment Exhibit, Biltmore Hotel, Los Angeles, Calif.

April 29-30. Metal Powder Show and Meeting, Drake Hotel, Chicago, Ill.

May 2-3. Joint Meeting of Dallas-Houston Paint and Varnish Production Club, Stoneleigh Hotel, Dallas, Tex.

Production Club Meetings

Baltimore, 2nd Friday, Belvedere Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Cincinnati Club;
Dayton — Nov., Feb., April, Van Cleve Hotel;
Indianapolis — Sept., Claypool Hotel;
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Hotel Auditorium.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, Last Monday, El Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Thursday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Building Trades Employers Assn.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings Only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 2nd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

Bill Nichols of C. K. Williams To Be Less Active in Sales

W. D. "Bill" Nichols, sales manager of the George S. Mepham Corporation from 1921 to 1948 and for C. K. Williams & Co. since the formation of the new company in 1948 is now taking a less active part in that company's business. Mr. Nichols expects to utilize his complete knowledge of iron oxide pigments in a market development and consulting capacity for C. K. Williams & Co., thus having more time to devote to his personal affairs.

H. P. Ball, pres. of Federation of Paint and Varnish Production Clubs speaking before N. England Club. Left to Right: Dr. W. Husen, H. P. Ball, S. White, C. Hamilton, C. H. Flynn.

ASK YOUR DU PONT

White Pigments Salesman

. . . to help you get maximum value from your pigment supply

Take full advantage of the "know-how" available through your Du Pont salesman. His training and experience, supplemented by the facilities of the Du Pont Pigment Laboratories, can be of valuable assistance to you.

Ask your Du Pont Salesman to review your pigment requirements and be sure you are getting all you should from the pigments you use.

E. I. du Pont de Nemours & Co. (Inc.)
Pigments Dept., Wilmington 98, Del.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT
WHITE PIGMENTS

Federation Heads Speak At New England Club

President Hiram P. Ball, president-elect G. H. Wescott, and executive secretary C. Homer Flynn, of the Federation of Paint and Varnish Production Clubs, were guests of the Philadelphia and New England Paint and Varnish Production Clubs on January 16 and 17, respectively.

President Ball set forth the aims and objectives of the Federation for 1952, putting particular stress on research and educational efforts.

President-elect Wescott spoke at some length on the streamlining of the Federation Inter-Society Relations.

Executive secretary Flynn spoke briefly on the operation of Federation Headquarters in Philadelphia.

•

Superior Lecithin Division Formed

The formation of a Superior Lecithin Sales Division to handle the marketing of Superior soya lecithin was announced by Meyer W. Budman, sales manager of Superior Materials, Inc., 120 Liberty Street, New York City. Budman stated that deliveries are being made of various grades of high quality refined lecithin. This product is used for easy wetting and dispersion of pigments, for counteracting sagging and adjusting viscosity, and for improved suspension. Superior Materials, Inc. has been selling raw materials and chemicals to manufacturers of paints, inks, adhesives and allied products for the past seven years.

•

Employee Supervisor Named At G-E Alkyd Plant

Frederic T. Clarke has been appointed employee relations supervisor for General Electric's Chemical Division alkyd resin plant in Schenectady, N. Y., according to an announcement by George M. Hartley, plant manager.

N. Y. Production Club Hears Two Interesting Speakers

The first meeting of the New Year for the New York Paint and Varnish Production Club was held January 3rd 1952 at the Building Trades Employers' Association in New York City.

Two hundred and twelve members and guests turned out to hear a fellow active member, Henry F. Payne of the American Cyanamid Company speak on the "Fundamentals of Film Formation and Film Properties."

He pointed out that organic coatings have become so commonplace that their unique property of readily forming strong, durable films from liquid compositions which are very simple to apply, has become overlooked and underestimated. The steel bodies of automobiles would corrode completely without the protection of a thin film of organic coating, and the lumber on our houses would crack and split without paint. Many other instances could be cited to show the value and importance of the unique material known as paint.

However, Mr. Payne emphasized the fact that coatings are no stronger than the linkages they contain. These linkages include those in the molecules from which the film was formed, and also those which connect the molecules to produce the solid film. Coatings fail at their weakest linkages even as the chain

H. F. Payne

Charles Gardner

fails at its weakest link. A knowledge of the chemical and physical properties associated with linkages such as the ester, ether, hydrocarbon, etc., enables the coating formulator to select his film forming materials more precisely to meet their requirements. Mr. Payne discussed the properties of the various linkages in considerable detail.

He also reviewed the concept of functionality and its importance in determining whether the film will be the covertible or the non-convertible type. He illustrated the increased rate of polymerization and speed of drying which is obtained as the functionality of the film former is increased. The four polymerization processes, autoxidative, condensation, addition and copolymerization, were reviewed with special emphasis on the types of linkages formed in each process with different monomers. The type and extent of cross-linking are important factors in the convertible coatings, and the size and shape of the polymers influence the film properties of the non-convertible coatings. Mr. Payne discussed the significance of relative polarity in the non-convertible coatings with respect to their solubility, compatibility and film forming characteristics. A question and answer period followed to wind up the evenings' program.

The regular February meeting was held on Feb. 7th. Some two hundred members and guests attended.

Mr. Charles Gardner of the Advance Solvent and Chemical Corp. presented a paper on "Surface Active Agents in the Protective Coatings Industry."

Surface active agents for the paint and varnish industry are those substances which aid pigment wetting, dispersion, emulsification, deflocculation and foaming. Mr. Gardner pointed out the fundamentals behind each type and show how it is possible to set up a qualitative determination of the best type to be used for specific purposes.

•

ADM Opens Office In Cincinnati

Archer-Daniels-Midland Company has recently opened a sales office at Cincinnati, Ohio. The office, located at 1133 Federal Reserve Bank Building, will be managed by Daniel J. Marien, Jr.

READ ALL ABOUT IT!
READ ALL ABOUT IT!
NEW ALKYDOL S-1190 PROVED PERFECT UNIVERSAL GRINDING LIQUID!
New Alkydol Development is Miracle Vehicle for Assisting in Grinding and for Shading and Tinting Colors
Alkydol S-1190 serves as a perfect universal grinding liquid for long or short oil alkyds, oleoresinous varnishes, and refined and bodied oils. It is universal in application; it is stable, it has excellent wetting properties; it is economical.
S-1190, although a new development, is already in full production and is available in large quantities.
Your 5 gallon trial order is an investment in flexibility and economy.
ALKYDOL Laboratories, Inc.
3230 S. 50th Ave.
Cicero 50, Ill.

NEWS DIGEST

William L. Schwalb

W. L. Schwalb Joins John H. Calo's Sales Staff

John H. Calo Company, Inc., 19 Rector Street, New York, N. Y., announces that William L. Schwalb, for many years active in factory management and purchasing, will take up Sales Promotion work in local territory.

●

Revised ASTM Standards on Drying Oils and Coatings

Tentative Methods of Testing Drying Oils (D 555—51 T) have been designed to meet the need of the paint and drying oil industries for a comprehensive set of Methods for the purpose implied. They replace previous ASTM Methods D 555-47 T, D 555—50 T, and D 967—48 T, and include pertinent sections drawn from other related ASTM methods.

The new Method for Measurement of Dry Film Thickness of Non-Magnetic Coatings of Paint, Varnish, Lacquer, and Related Products Applied on a Magnetic Base (D 1186—51 T) (Magnetic Gage Method) supplements the Tentative Method of Test for Measurement of Dry Film Thickness of Paint, Varnish, Lacquer, and Related Products (D 1005—49 T). It is also recommended for thin films, less than 0.5 mil (0.0005 in.) in thickness. It does not apply to excessively soft films.

Tentative Specification for Asphalt Base Emulsions for Use as Protective Coatings for Metal (D 1187—51 T) is largely a performance type specification, but does include some general requirements on composition of the material. This material has been in general use for about twenty years and there has been a need for specifications. Methods of tests for these materials were completed in 1949 and were issued under the designation D 1010—49 T.

●

T. M. Stokes Heads Sales of Robertson Co. in Louisville

Robertson Company, Inc., Louisville, Kentucky, Manufacturers of Wood and Metal Coatings, announce the election of Mr. Thomas M. Stokes to Vice-President in Charge of Sales.

Prior to joining the Robertson Company, in 1949, Mr. Stokes was a sales representative in the sales division of Tube-Turns, Inc., Louisville, Kentucky. Until his recent election to Vice-President, Mr. Stokes has been the Southern Indiana sales and technical representative of Robertson Company, Inc.

Harold D. Craft

W. J. Rothemitch

R-B-H Changes

William J. Rothemitch, formerly divisional president of the R-B-H Dispersions, Division of Interchemical Corporation, Bound Brook, New Jersey, has been elected a vice president of Interchemical Corporation, New York. Harold D. Craft, former sales manager for R.B.H will succeed Mr. Rothemitch as divisional president.

Carbon black is a constant challenge to our dispersion technicians. We sometimes think they can't go much further with jetness unless they personally wrap up each particle of carbon black in a blanket of the binder. Our #1001 (in nitrocellulose), and our #2064 (in a baking-type alkyd) are as good as any we have ever seen. And it's our business to look at them all.

The R-B-H standard line of 24 black dispersions in seven binders offers a black for every formulating need. Our economy black provides a pigment concentration of 25%.

How about a sample? What's your black problem?

R-B-H . . . for finishes of integrity.

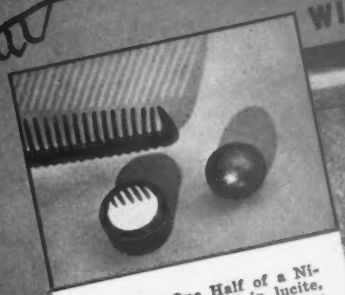
R-B-H Dispersions

DIVISION OF INTERCHEMICAL CORPORATION
DISPERSION TECHNICIANS
BOUND BROOK, NEW JERSEY

Pigment dispersions in nitrocellulose; ethyl cellulose; urea formaldehyde, vinyl and alkyd resins; chlorinated rubber and other plastic binders.
R-B-H IS A TRADE-MARK OF INTERCHEMICAL CORPORATION

PAINT MANUFACTURERS!

CUT GRINDING COSTS AND AVOID DISCOLORATION with PENNEBACKER NI-HARD BALLS



(left) One Half of a Ni-Hard ball mounted in lucite, ground and polished to mirror finish to demonstrate soundness of structure. (right) Typical ¾" Ni-Hard grinding ball.

A charge of ⅞" Ni-Hard balls after 5 months of paint grinding service.

Ni-Hard, the nickel-chromium iron which has successfully demonstrated its resistance to abrasion in the milling of both metallic and non-metallic minerals, is now available at moderate cost to the Paint Industry in the form of grinding balls.

The high hardness and wear-resistance of Ni-Hard means longer service life in the grinding of pigments, hence higher production and ultimate economy.

Moreover, discoloration is minimized when Ni-Hard balls are used. Paint manufacturers have found that pastel pigments can be safely ground with Ni-Hard balls where previously flint pebbles had to be used to avoid discoloration which occurred with steel balls. Naturally also, the greater density of the metal ball makes a substantial contribution to mill efficiency as compared with the use of the lighter pebbles.

FIELD PROVEN SUPERIORITY:

1. On ¾" diameter balls grinding magnesium silicate in mineral oil, Ni-Hard showed an approximately 2 to 1 superiority over two types of high carbon steel as follows:

BALL MATERIAL	% WEIGHT LOSS IN 5,000 HOURS
Ni-Hard	5.52
Steel A	11.35
Steel B	12.95

2. A midwestern paint plant using ⅞" balls reported the following results:

BALL MATERIAL	WT. LOSS (LBS.) IN 2,500 HOURS
Ni-Hard	103
Steel	182–202

3. A Pennsylvania paint plant has used ⅞" Ni-Hard balls in regular grinding mill service for four years with excellent results both as regards economy and avoidance of discoloration problems.

Numerous paint manufacturers have now regularly adopted Ni-Hard balls. Interim reports indicate an increasingly wider acceptance of this efficient yet moderate priced modern grinding medium throughout the Paint Industry.

- Pennebacker Ni-Hard balls are available in four sizes: ⅝", ¾", ⅞" and 1" diameters.

- Delivery: Immediate, in bags or drums. All balls supplied in the *stress-relieved condition* to assure the maximum combination of abrasion-resistance and toughness.

THE PENNEBACKER COMPANY, EMMAUS, PA.

PATENTS

Conducted by

Lancaster, Allwine & Rommel

PATENTS AND COPYRIGHTS

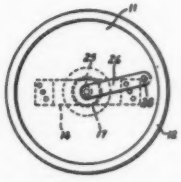
424 Bowen Building,
Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Antifouling Pipe Line Enamel

U. S. Patent 2,580,025. August Holmes, Cranford, N. J., assignor to Standard Oil Development Company, a corporation of Delaware.

An improved coating material suitable for employment in tropical waters which comprises from 0.5 to 5% of antimony oxide and from about 40 to 70% of a bituminous material having a softening point in the range from 200 to 250° F. and a filler.



U. S. PATENT 2,579,874

Paint Stirrer and Blender

U. S. Patent 2,579,874. Anne S. Shaw, Philadelphia, Pa.

A paint stirrer and blender comprising means to support it in operative position on a container and embodying a bearing member and a well disposed above the bearing member and having a wall provided with an opening therein, a rotatable paddle including an actuating shaft having an upper end portion journaled in the bearing member and projecting into the well through the opening in the wall of the latter, manually operated means for actuating the shaft and means, comprising a solder joint, forming a normally rigid hermetic seal between the shaft and the surrounding wall of the well, adapted to release the shaft upon the application of torsional force thereto.

Improving Drying And Semi-Drying Oils

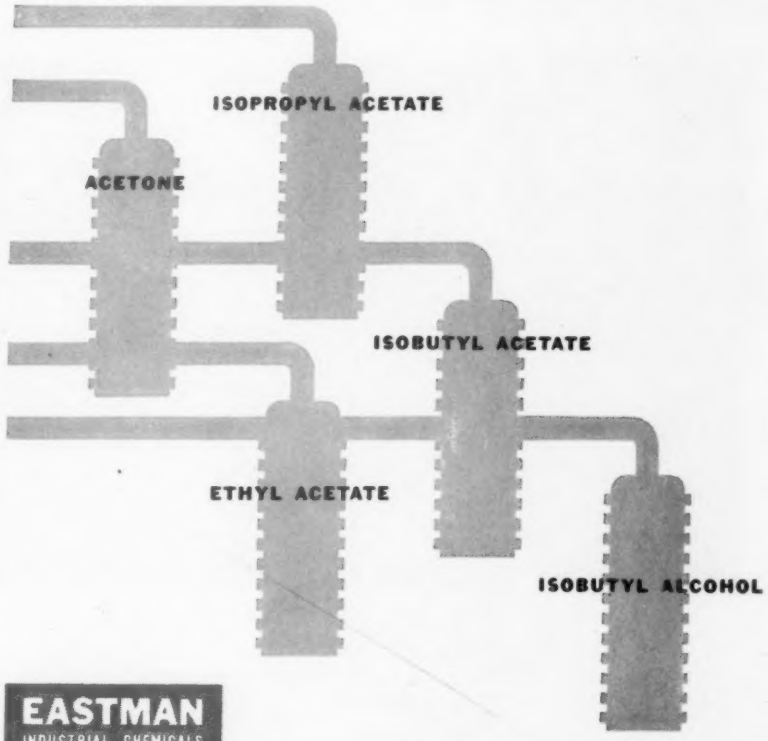
U. S. Patent 2,575,529. Sol B. Radlove, Newton, Iowa, assignor to the Maytag Company, Newton, Iowa, a corporation of Delaware.

The process of producing the catalytic isomerization of vegetable drying and semi-drying oils and their derivatives comprising the step of heating the oil at a temperature of from 250° to 315°C. in the presence of an organic compound having a chemical structure including a quinone radical, said organic compound being present in the amount of approximately 2 to 5 parts by weight to each 100 parts of the oil treated.

Treatment of Glyceride Oils

U. S. Patent 2,573,896. Stephen E. Freeman, Pittsburgh, Pa., assignor to Pittsburgh Plate Glass Company, Allegheny County, Pa., a corporation of Pennsylvania.

A method of treating glyceride oil containing glycerides of different degrees of unsaturation which comprises extracting the oil with furfural to provide a liquid furfural solution which contains unsaturated glycerides and a second liquid phase which contains relatively more saturated glycerides, separating the liquid furfural solution from the second liquid phase, extracting the furfural solution with a liquid paraffin



EASTMAN
INDUSTRIAL CHEMICALS

solvents

These products are stored in bulk in Chicago, Illinois and St. Louis, Missouri by DeMert & Dougherty, Incorporated; and in Akron and Cincinnati, Ohio by Anderson-Prichard Oil Corporation.

SALES REPRESENTATIVES: New York—10 E. 40 St.; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; Houston—412 Main St. West Coast: Wilson Meyer Co., San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.

TENNESSEE EASTMAN COMPANY Division of Eastman Kodak Company KINGSPORT, TENNESSEE

hydrocarbon to separate glycerides therefrom, leaving in the furfural a concentrate comprising unsaponifiables and saponifiables, saponifying the saponifiables and extracting unsaponifiables with a petroleum hydrocarbon.

Coating Composition

U. S. Patent 2,577,709. Paul E. Marling, Dayton, Ohio, assignor to Monsanto Chemical Company, St. Louis, Mo., a corporation of Delaware.

A method of preparing a coating composition which comprises heating vinyl esters of tall oil acids while gradually adding thereto from 33-1/3 percent to 300 percent of a mixture of 50 to 95 percent styrene and 5 to 50 percent of a compound of the group consisting of isopropylbiphenyls and isopropylbenzene, at the reflux temperature of the reaction mixture, and in the presence of the catalyst, benzoyl peroxide; and continuing heating the mixture to a temperature of 500 to 550°F., and thinning the product with a miscible solvent.

Polyethylene Wax Compositions

U. S. Patent 2,577,816. Helmuth G. Schneider, Westfield, David W. Young, Roselle, and Julius P. Rocca, Linden, N. J., assignors to Standard Oil Development Company, a corporation of Delaware.

A composition of matter comprising 1 to 50% of polyethylene in chlorinated wax containing 2 to 8% chlorine.

Anticorrosion Compositions

U. S. Patent 2,580,288. Morton Fainman, Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill., a corporation of Indiana.

A composition consisting essentially of a major proportion of a liquid oleaginous lubricating material, and from about 0.001% to about 5% of a dialkoxy diaminosilane in which the alkoxy groups contain from 1 to about 20 carbon atoms.

Rust Inhibiting Compositions

U. S. Patent 2,580,036. Alfred H. Matuszak, Jersey City, and James W. Hand, Jr., Summit, N. J., assignors to Standard Oil Development Company, a corporation of Delaware.

A mineral lubricating oil containing dissolved therein 0.01% to 10% of pentaerythritol mono-oleate and 0.001% to 5% of propylene diamine.

Polyvinyl Acetate Emulsion

U. S. Patent 2,577,734. Howard C. Brinker, South St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn., a corporation of Delaware.

Polyvinyl acetate emulsion plasticized with a composition comprising an ester of a polyhydric alcohol and abietic acid having at least one unreacted hydroxyl group.

Oxidation of Cumene

U. S. Patent 2,577,768. George G. Joris, Convent, N. J., assignor to Allied Chemical & Dye Corporation, New York, N. Y., a corporation of New York.

In a process for oxidizing cumene to cumene hydroperoxide in liquid phase with elemental oxygen as oxidizing agent, the improvement which comprises maintaining solid sodium bicarbonate in contact with said cumene, at reaction temperature in the range between about 60°C. and about 90°C.

NOW THESE PAINTS DON'T DISCOLOR. Some years ago the light-colored paints produced in this plant began to discolor. After tracing the trouble to his thinner, the manufacturer switched to Sun Spirits. He has had no trouble maintaining his high standards of quality since he made this change.

4 REASONS WHY IT PAYS TO SPECIFY SUN SPIRITS

Sun Spirits is a carefully balanced product. It has good wetting-out power. Volatility is controlled to insure a rate of drying neither too fast nor too slow. Purity is checked and rechecked to make certain of a reliable, high-quality product. In new formulas, as well as old, and in testing new materials, you can rely on the uniformity and quality of Sun Spirits. For full information, get in touch with the nearest Sun Office.

SUN INDUSTRIAL PRODUCTS
SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO & MONTREAL

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Patent Practice before U. S. Patent Office. Validity and Infringements Investigations and Opinions.
Booklet and form "Evidence of Conception" forwarded upon request.

TECHNICAL Bulletins

X-RAY DIFFRACTION

A new 8-page booklet titled "What is X-ray Diffraction" is available from the Research & Control Instruments Division, North American Philips Company, Inc., 750 South Fulton Avenue, Mount Vernon, N. Y.

Purpose of the booklet is to alert industry to the uses of this type of equipment for problems which involve plastics, paints, fibres, cements, vegetable oils, dairy products, foods, pharmaceuticals, leathers, paper and parchment, soaps, metals and alloys, rubber, chemicals, glass and petroleum.

Booklet points out how this nondestructive analysis method is helping to speed the defense program in identifying components or raw materials to assure uniformity, in identifying unknown materials and constituents of mixtures, and in identifying impurities.

Also covered are the uses in production for selection of raw materials, for production analysis and control, for tracing physical or chemical changes during technological processes, and for checking quality of finished products.

TESTING INSTRUMENTS

Two leaflets describe the Gardner Film Casting Knife and the Gardner Washability Apparatus and their use in testing specific properties of surface coatings. Henry A. Gardner Laboratory, Inc., Bethesda, Md.

ASPHALT PRODUCTS

Booklet contains descriptions and uses of such products as gilsonite, natural asphalt, stearine, pitch, cottonseed pitch, asphalt solutions, waxes, fatty acids, polyamide resins, soybean oil, allyl starch, etc. G. S. Ziegler & Co., 233 Broadway, New York 7, N. Y.

HAND TRUCK

A 2-color bulletin with complete descriptions, specifications, and prices of Wheel-Ezy hand trucks has been published by The Rapids-Standard Company, Inc., Grand Rapids, Michigan. Photos and full details on four models and four wheel types allow selection of the right Wheel-Ezy to move loads weighing up to 500 pounds.

GRINDING

"Continuous Grinding," a new 28-page catalog in which Patterson ball and tube and rod mills are detailed, has been published by The Patterson Foundry & Machine Company of East Liverpool, Ohio.

Included in the catalog are over 50 illustrations; technical descriptions; and charts which show size, weight, linings, ball charge, speed, power requirements and motor sizes for the various mills. Also, special consideration is given to accessory equipment such as feeders and mill drives. In addition to descriptions of the mills themselves, complete Patterson continuous grinding systems are discussed.

STYRENE MONOMER

Thirty-six page bulletin gives detailed information on the properties, chemical reactivity, handling, and uses of styrene monomer. Koppers Co., Inc., Pittsburgh, Pa.

FLATTENS THE FINISH

. . . *INCREASES MILL ROOM CAPACITY.* **SYLOID 308 is a finely-sized synthetic silica of extremely high purity designed to produce a lower gloss finish. Less flatting agent is required . . . mill room capacity is often doubled. Rigid production controls insure a uniform product for uniform results.**

SYLOID 308 gives superior results at lower cost. Great savings are gained in the mill room because Syloid mill bases can be made highly concentrated . . . with a very short grinding time. There is no mill base seeding.

For additional information or help on a specific problem write Davison's Technical Service Department. **eT. M. Reg. Applied For**

Progress through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, SILICOFLUORIDES AND FERTILIZERS

FIRE EXTINGUISHERS

"Correct Fire Protection" is intended as a guide for operators of fire extinguishing in selecting the correct extinguisher for use on various types fires. Various sizes and types of units are described with different kinds of fire extinguishing agents. American-LaFrance-Foamite Corp., Elmira, N. Y.

MILITARY PACKAGING

Manual on Preservation, Packaging and Packing Military Supplies has recently been issued by the Department of Defense Agencies. This manual is based largely on former Navy publication but covers Army, Navy and Air Force. Write to the Government Printing Office, Superintendent of Documents, Washington, D. C. for your copy.

HARD GUMS AND ALKYD RESINS

Products catalogue gives complete technical data on the Alkydol line of hard gums and alkyd resins for the paint, varnish, lacquer, printing ink and paper coating industries. Several formulations are also given. Special attention is given to government specification items. Description of new line of improved alkyds are also included. Alkydol Laboratories, Inc., 3242 South Fiftieth Ave., Cicero 50, Ill.

PLASTICIZERS FOR ALLYL STARCH

The Baker Castor Oil Company, 120 Broadway, New York 5, N. Y. offers a Technical Bulletin on the use of several Baker plasticizers with allyl starch. Formulations are given illustrating the efficient plasticization afforded by the use of Baker products.

AIR HEATERS

Portable and built-in electric air heaters used in every industry and business are described in a new four-page folder available from Edwin L. Wiegand Company, 7632 Thomas Blvd., Pittsburgh 8, Pa. Convection, blower, duct and radiant types available for immediate shipment are shown along with suitable automatic controls. Ask for folder F-1530.

New Resins

Line of new resins are recommended for formulating all types of finishes. Timely resins have been developed to relieve existing raw material shortages and meet government specifications. U. S. Industrial Chemicals Co., 60 E. 42nd St., New York 17, N. Y.

PLASTICIZERS

76-page book on "Flexol" brand plasticizers, which describes their properties and applications in plastics, coatings, and rubber compounds, is now being distributed.

The book contains descriptive write-ups on 12 "Flexol" plasticizers and a wealth of graphical and tabular comparisons of their properties; including volatility, extraction, resistance, and low-temperature and electrical properties.

There are also detailed sections describing the specific utility of the "Flexol" plasticizers in vinyl dispersions, nitrocellulose lacquers, natural and synthetic rubbers, and plasticizer emulsions.

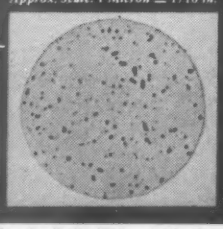
Copies of this catalog (F-5882A) may be obtained from Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, New York.

for high-gloss

INTERIOR FINISHES

A high oil absorption type pigment of very fine particle size with high rate of reactivity and high consistency in reactive vehicles.

Magnification 1500X
Approx. Scale: 1 Micron = 1/16 in.



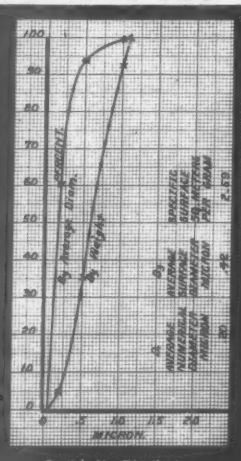
ST. JOE BLACK LABEL #20

Representative Chemical Tests

ZnO	99.20%
Pb	.03
Cd	.01
Cl	.02
Acidity as SO_3	.03
Total S as SO_3	.05
H_2O Soluble Salts	.15
Insoluble in HCl	.15
Loss at 110°C.	.30

Representative Physical Tests

Particle Size	
Average numerical diameter D_1 – microns	.20
Average surface diameter D_3 – microns	.42
Specific surface – Sq.M./gram	2.59
Percent fines under .50 micron	35.0
Specific Gravity	5.65
Apparent Density – lb./cu. ft.	22.
Cleanliness	
Percent thru 325 mesh screen	99.97
Oil Absorption – Rub-out	
Grams oil/100 grams ZnO	16.5



Particle Size Distribution

For fine quality interior gloss finishes we recommend St. Joe Black Label #20, an extremely fine particle size lead-free Zinc Oxide. In addition to contributing to the development of the desirable "puffy" consistency preferred by the painter, Black Label #20 also exerts a favorable effect on initial gloss, gloss retention and resistance to yellowing.

Complete physical and chemical properties of our paint grade zinc oxides are described in our new technical manual, ST. JOE ZINC OXIDES. Write for your free copy – on your company letterhead please.

ST. JOSEPH LEAD COMPANY

250 PARK AVE.
NEW YORK CITY 17

Plant & Laboratory: Monaca (Josephtown) Pa.

SPECIMEN HOLDER FOR TABER ABRASER

Description of all types of specimen holders used with Taber Abraser are given in Bulletin 5105. Taber Instrument Corp., 11 Gouncry St., North Tonawanda, New York, N. Y.

SURFACTANTS

Esters of glycerol, glycols and polyethylene glycols are fully described in the new issue of the booklet, "Esters by Glyco."

This 24 page brochure gives tables of physical and chemical specifications of the non-ionic polyhydric alcohol fatty acid esters. Use data are listed for such applications as surface-active agents, emulsifiers, stabilizers, defoamers, penetrants and plasticizers.

Interesting applications of the esters are described in the fields of plastics, cosmetics, metals, paints, insecticides, textiles, detergents, etc.

Copies of the new issue of "Esters by Glyco" are promptly available, free of charge, on request from Glyco Products Co., Inc., 26 Court Street, Brooklyn 2, N. Y.

INSULATING MATERIALS

The various types of electric insulating materials produced by the General Electric Company's Chemical Division are described in a new bulletin, CDL-35, recently published by the Division.

Properties and applications of G-E varnishes, Glyptal alkyd resin insulating finishes, varnished cloths and tapes, sealing and filling compounds, and G-E silicone insulating materials are described, with accompanying photographs.

Copies of this bulletin may be obtained by writing to the Chemical Division, General Electric Company, Pittsfield, Mass.

MATERIAL HANDLING PROBLEMS

Sixteen page booklet entitled "Materials Handling Analysis Guide" was prepared to help factories where no full-time materials handling engineer is on the staff. The guide affords a method of determining rapidly basic materials handling requirements of a business.

Subjects the questions deal with include the relationship of materials handling to production, costs, shipping, and packing. Included is a simple "scorekeeping" system that determines if a firm needs further help in investigating ways to eliminate its problems.

The booklet can be obtained without charge by writing to the Automatic Transportation Company at 149 West 87th Street, Chicago 20.

REFINISHING WITH HOT-SPRAY

To meet the fast growing interest in "Hot-Spray" refinishing of automobiles, James A. Bede, President of Bede Products Inc., Cleveland, Ohio, has just published an eight page informative booklet explaining the process. The booklet entitled "Hot Spray of Automobiles" offers a brief discussion on the theory and practice of the "Hot-Spray" method as applied to Automotive refinishing. The booklet points out that the "Hot-Spray" process is a result of intensive development and experimental work by both equipment and paint manufacturers.

Copies of this booklet can be had by writing direct to Bede Products Inc., 4311 Ridge Road, Cleveland 9, Ohio. Bede Products Inc. are the leading manufacturers of paint-heating equipment used in "Hot-Spray" painting.

QUALITY PRODUCTS!

Acetone
Adhesives, Synthetic Resin
Alcohol, Denatured
Alcohol, Industrial
Alcohol, Proprietary Solvent
Aluminum Paste
Aluminum Powder
Amyl Acetate
Anti-Flooding Agent
Anti-Livering Agent
Anti-Sagging Agent
Anti-Skinning Agent
Beeswax
Benzol
Blown Oils
Burgundy Pitch
Butyl Acetate
Butyl Stearate
Calcicoaters
Calcium Chloride
Candelilla Wax
Caustic Soda
Carnauba Wax
Castor Oil
Coal Tar
Coal Tar Oil
Coal Tar Pitch
Cocoanut Oil
Cocoanut Oil Fatty Acids
Copper Naphthenate
Corn Oil
Cottonseed Fatty Acids
Cottonseed Pitch
Creosote
Defoamers
Detergents
Diacetone
Dipentene
Driers-Naphthenate, Octoate & Linoresinate
Dry Bleached Shellac
Emulsifiers
Enamel Vehicles
Ester Gums
Ester Gum Solution
Ethyl Acetate
Fatty Acids
Fatty Acid Distilled
Fish Oil & Specialties
Gilsonite and Solutions
Gloss Oil
Glycerine, Crude
Glycerine, High Gravity
Isopropyl Alcohol
Kidney Oil
Lacquer Thinners
Linseed Oil
Linseed Oil Fatty Acids
Litharge
Mildew Preventitives
Montan Wax
Naphthalene
Naval Stores
Nitric Acid
Oiticica Oil
Oleic Acid
Orange Gum Shellac
Paint Oils
Paint Thinners
Paint & Varnish Driers
Paint & Varnish Removers
Peanut Oil
Phenothiazine
Pine Oil
Pine Tar
Pine Tar Oil
Pinene
Pitch and Pitch Solutions
Plasticizers
Plasticizing Oils
Printing Ink Driers
Puffing Agent
Rapeseed Oil
Rapeseed Oil, Blown and Refined
Red Lead
Red Oil
Resin Alcohol Soluble
Resin Dispersions and Emulsions
Resin Plasticizers
Resin Solutions
Resin Solvents
Resins, Alkyd (Solid and Solution)
Resins, Coumarone-Indene & Solution
Resins, Maleic
Resins Pentaerythritol
Resins Phenolic
Rosin
Rosin Derivatives
Rosin, Dry Soap
Rosin Hydrogenated
Rosin Limed
Rosin Oils
Rosin Polymerized
Rosin Residues
Rubber Compounding Materials
Rubber Reclaiming Agents
Safflower Oil
Shingle Stain Oil
Soda Ash
Solvent Naphtha
Solvent Naphtha-High Flash
Solvents, Terpene
Soybean Fatty Acids
Soybean Foots
Soybean Oil
Stabilizers
Stearates—All Types
Stearic Acid
Sulfonated Oils
Tackifiers
Tall Oil, Crude
Tall Oil, Refined
Terpene Hydrocarbons
Textile Chemicals
Toluol
Tung Oil
Turpentine, Gum and Wood
Turpentine, Sulfate
Vegetable Oils
Vegetable Oil Fatty Acids
Vinyl Resin, Plasticizers, Stabilizers
Waxes
Wax Substitutes
Wetting Agents
Wood Preservatives
Xylol

JOHN H. CALO COMPANY
INCORPORATED
19 RECTOR STREET
NEW YORK 6, N.Y.
Telephone
WHITEHALL 3-6866

MACHINERY VIBRATION

(*From page 39*)

vibration elimination. Natural cork plates call for the same accurate loading for maximum efficiency as do other systems of isolation. The table of loadings that has been calculated for these other systems may be used just as successfully for natural cork plates. Results are greater efficiency and lower cost. Cork plates are made from a pattern of strips of pure natural corks with a steel confining frame. Natural cork plates may be installed under conditions where they are in continuous contact with oil without losing their efficiency.

The use of vibration eliminator *rails* for certain types of machinery has greatly increased. These rails are supplied both in rubber-in-shear and in cork.

Both designs are convenient and effective, since they are supplied in lengths to meet conditions, and the built-in isolation units are located according to the distribution of the weight of the machine. These isolation units are metal housed and locked in place. The housing provides a level bearing surface on the cork or rubber. Rails are drilled and tapped for machine foundation bolts with ample threading surface. Where driver and driven are not on a common base or where the machine base itself needs continuous support the rails provide this necessary base and support. These rails also help to distribute the weight over the floor area since the bottom member extends the entire length of the rail. Installation is relatively simple as extending lugs at the ends of the rails are drilled for lagging to the floor. The cork rails are used where contact with oil is possible. The rubber rails are recommended where the supporting structure is not rigid.

Today, vibration of paint machinery is a known factor, and its results are a known fact. Modern engineering has given increased attention to this important production-management question, and the results of the modern engineers' work has been realized in the design and manufacture of greatly improved and flexible isolators now at the service of the Nation — at a time when every possible effort and every possible potential is vitally needed for the Defense Program.

SOME TIPS ON PAINT MAKING MACHINERY VIBRATION ELIMINATION

It is unwise to put a solid sheet of cork, rubber or other material under a complete base.

Don't neglect the overhang of the drive or the machine will rock.

Use a material that won't soften in hot weather or harden in cold.

Allowance for uneven distribution of weight is vitally important.

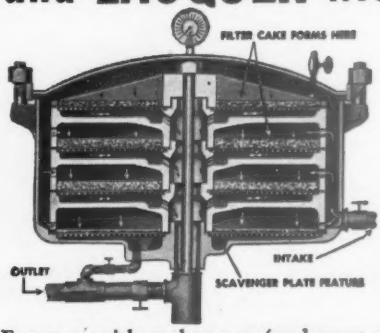
Avoid any isolator that is brittle.

A "lifeless" isolator is sure to pack and settle in time.

Isolation material should not be too hard or too soft.

Driver and driven should always be mounted on a common rigid base before isolating.

CLARIFY VARNISH and LACQUER with... SPARKLER horizontal plate FILTERS



Model 18-S-12 Varnish Filter in mildsteel (steam jacketed)

Every varnish maker can (and most of them do) use a Sparkler Filter to improve the clarity and brilliance of varnishes, lacquers and other clear liquids by removing "fish-eyes," skins, and other incidental solids and semi-solids.

We invite correspondence on any special problem related to either of the above processes. Our engineers are ready to give you the benefit of years of experience in this field.

SPARKLER MANUFACTURING COMPANY, Mundelein, Illinois

Witco Names Brubaker Sales Mgr. of Carbon Black Div.

Mr. Harry M. Brubaker has been appointed assistant sales manger of the Carbon Black Division of Witco Chemical Company. He will occupy offices at 311 Evans Building in Akron, Ohio. Before joining Witco, Mr. Brubaker was with B. F. Goodrich's Hycar Division, the Phillips Chemical Company, and the Sid Richardson Carbon Company.

DEVELOPMENT, RESEARCH

(*From page 33*)

Maintenance and Repair

YOUR Development set-up does not always work according to schedule. When you see a lag in schedule find out why at once. Check your team for soundness and strength of its original purpose and for unified will throughout. Then see if you planned adequately and followed-thru consistently. Were your objectives too great for the means at hand? Were your men systematically indoctrinated and did all have strength to adhere to the original idea?

The direct result of Development work is a product; the indirect result of Development work is developed men.

In the environment of *selecting* facts, materials, process correlations, data, the *natural selection* of men also takes place.

The problems confronted in a development program promptly bring out the measure of a mans mental height, width and depth. Experience in Development operations increases our accuracy of judgment, points up our ability to organize and select important points to attack, emphasizes our ability to plan, gives us practice in making our own decisions and then convincing others of their soundness, sharpening our follow through effectiveness.

Development work puts a clear strong light on the ability of a man to carry out intelligent action.

•

Continental Can Executive Appointments

Lawrence Wilkinson succeeded J. S. Snelham as vice president in charge of finance for Continental Can Company upon Mr. Snelham's retirement January 1.

Mr. Wilkinson has been a vice president of the company since September 1951, prior to which time he had been director of the New York Civil Defense Commission, a colonel in the U. S. Army and a vice president of Marine Midland Trust Company.

Mr. Snelham will continue to serve as a consultant to the chairman and president. He has been vice president in charge of finance since October 1950.

G-E Appointments at Phenolic Plant in Pittsfield, Mass.

Royce W. Hill of the General Electric Company's Chemical Division has been appointed supervisor of production at the phenolic products plant here, according to an announcement by Arthur T. Bourgault, plant manager.

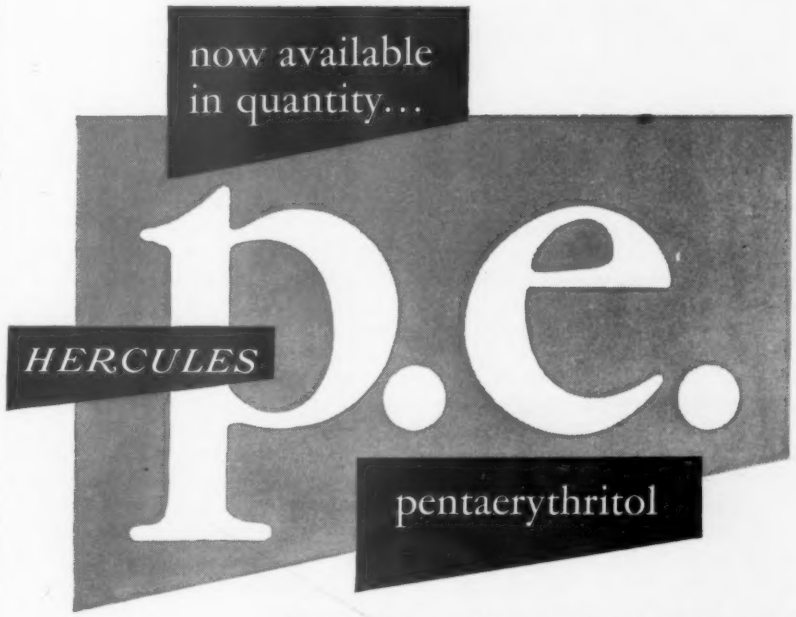
Concurrently, J. Edward Keegan was appointed supervisor of customer service at the phenolic products plant, replacing Mr. Hill, as announced by Wallace W. Ryall, manager of sales administration and control for the chemical materials department.

Van Cleve Elected V. Pres. of Sherwin-Williams Pigments

President A. W. Steudel of The Sherwin-Williams Company reported at the recent annual meeting of shareholders that the company's sales from September 1st to date were within one per cent of the corresponding period last year and 32% above the 1949 period.

B. M. Van Cleve, Director of the company's Pigment, Chemical and Color Division, headquarters in New York, was elected Vice President.

All other directors and officers of the paint concern were re-elected.



for high-quality synthetic resins and oils at substantial savings

DO YOU KNOW ABOUT ABITOL®?

Another Hercules alcohol—of interest to many diversified industries because of its unusual combination of properties is Abitol (Hercules hydroabietyl alcohol).

A low-cost, high molecular weight resin alcohol, it is a colorless, tacky, viscous fluid at room temperatures. Abitol may be easily reacted, and posesses good stability. It has found application as a raw material for the manufacture of many products, including alkyds, label lacquers, rotogravure inks. Send for testing sample and technical data.

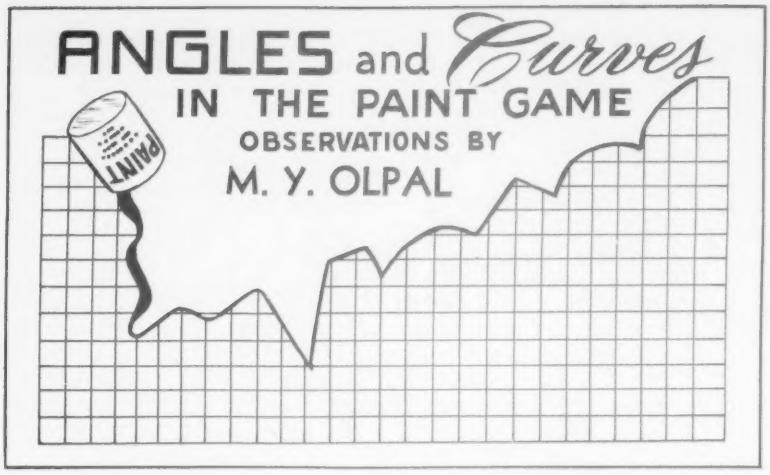
With the completion of expanded production facilities at its Mansfield, Massachusetts, plant, Hercules offers the protective coatings industry and others a dependable source of technical grade P.E. of high chemical purity. This essential ingredient broadens still further Hercules service to the process industries as a supplier of basic chemicals.

Hercules' pioneering in the development of high-quality products containing pentaerythritol began early in the 1920's. This pioneering work and continuing research led to the quantity production of many new P.E. products during the 1940's. At this time, heavy demand for these new products was a major factor in the commercialization of pentaerythritol. Today, as a result of this continuous research and large scale manufacture, not only is P.E. in adequate supply but it has a strong position technically and economically because it makes possible improved properties in many ester-type products at attractive savings.

Orders for P.E. are now being accepted at competitive prices, and contracts are available.

HERCULES POWDER COMPANY Synthetics Dept., 926 Market St., Wilmington, Del.

IC52-1



Jane stalked into the office and plopped into her chair with grim determination. She smoothed out the white Angora sweater and glared. "All you have to do is tell me," she blurted out.

I looked up from my desk rather puzzled. "Tell you? Tell you what?

"If you don't want me wearing sweaters around the office, just tell me. You don't have to get all of the boys in the lab to draw curves all over the place. After all, I'm not stupid," she complained.

"Oh, now, wait a minute, Janie," I cautioned. "Nobody wants you to change your manner of dress. I think there is some mistake."

"Mistake, humph," Jane snorted. "You just go and see what Joe is drawing, Mr. Olboy, and you'll see what I mean."

"Okay," I replied as I left the office.

Joe was making a graph of weight per gallon versus batches for some of our big volume numbers. The graph that he was just completing was one of the smoothest probability curves I had ever seen — with one exception. There had been a sufficient number of batches around the average to make a blister or separate protrusion right at the peak of the curve. I chuckled as I realized why Jane had been insulted. I borrowed the graph and returned to the office.

"Now there's nothing to be alarmed about, Janie," I started.

"See! What did It tell you?" Jane crowed as she recognized the graph.

"Now, now. This isn't what you think it is," I said quietly. "This is simply a hard boiled and realistic approach to correct some of the customer complaints that we've been having lately."

"What?" Jane blushed. "You mean that —. Oh, no."

"Wait a minute, before you go into hysterics," I said as calmly as I could. "This is simply a graph. What we are trying to do is use statistics to keep ourselves out of trouble. From the data on this graph we can predict when we shall have customer complaints and when we won't."

"Statistics?" Jane inquired from behind her handkerchief. "Just what do you mean?"

"Simply this. With a statistical approach in our work we will be able to reason and predict quantitatively instead of only qualitatively. You know of course that we paint developers are primarily crystal gazers. We have to predict how various raw materials will act under various exposure conditions. We have to guess how a test method will work out in actual practice. We have to predict how long a paint job will last. We also have to have an idea as to how many customer complaints we might have with any one formulation that we put out. Statistics is a tool for helping us make better predictions."

"Humph." Jane pouted. "You're just making up a fancy story because your little joke didn't go over, Olboy. I'm wise to you."

"I'm serious, Jane," I explained. "Here, look at this graph. You see here? As long as the weight per gallon on this paint stays between 10.3 and 10.8 pounds, we are alright. But as soon as it gets in the range of 10 to 10.3 or 10.8 to 11.1, we get about one complaint for every hundred gallons. And what is more, as the weight moves further from the desired average, the rate of complaints goes up. When the weight is lower than 9.5 or higher than 11.8, we can't even send it out because we get too many people sending it back for credit."

"Well, that's pretty interesting," Jane said. "So now, what do you do."

"Simply this. When the weight per gallon is between these values we send it out. Between these values, our formulator looks it over for readjustment. When it gets out here, it is brought to my attention because something drastic is wrong. If we find out what it is right away, we can correct it without too much financial loss.

Jane looked at the graph with mixed emotions. "Well, I can see now that Joe wan't just being funny when he said he was drawing a graph for quality control."

•

H. W. Gillet Memorial Lecture Established by ASTM and Battelle

The American Society for Testing Materials has announced the establishment of an annual H. W. Gillett Memorial Lecture. The purpose of this lecture, which is being sponsored in cooperation with Battelle Memorial Institute, is to commemorate Horace W. Gillett, who was one of America's leading technologists, the first Director of Battelle in Columbus, Ohio, and an active worker for many years in ASTM.

The memorial lecture will be delivered annually at a meeting of the Society, the first to be given at ASTM's 50th Anniversary Meeting in New York City during the week of June 23, 1952. The lecturer, who will be selected through a committee appointed by the ASTM Board of Directors, will cover a subject pertaining to the development, testing, evaluation, and application of metals.

•

Ansbacher-Siegle Corp. Engages E. L. Duhring as Consultant

E. L. Duhring was recently engaged as a consultant to the Research and Development Department of the Ansbacher-Siegle Corporation, has had wide experience in research and manufacture of pigments, dyestuffs, printing inks and varnishes. Before coming to Ansbacher-Siegle, Mr. Duhring was Director of Research for F. H. Levey Co. of Philadelphia and prior to that was employed as a Research Chemist in the Pigment Division of the DuPont Company.

GET PEAK EFFICIENCY IN FUME, VAPOR AND ODOR CONTROL . . . . . WITH MULTI-WASH

The outstanding efficiency of the Multi-Wash system in the paint, varnish and lacquer industries has been substantiated by a recent 3 months test by a mid-west association representing these industries.

The equipment was tested on varnish kettles with a maximum of 1000 c.f.m. output of fumes. The material tested was long oil linseed phthalic alkyd at the highest temperature of 475°. The next test was with tall oil esterified with glycerine at 570° temperature. On both tests Multi-Wash showed the highest efficiency rating in competition with seven other makes of collectors.

Let our engineers help you solve the fume and odor nuisance in your plant. Call our nearest representative or write direct to

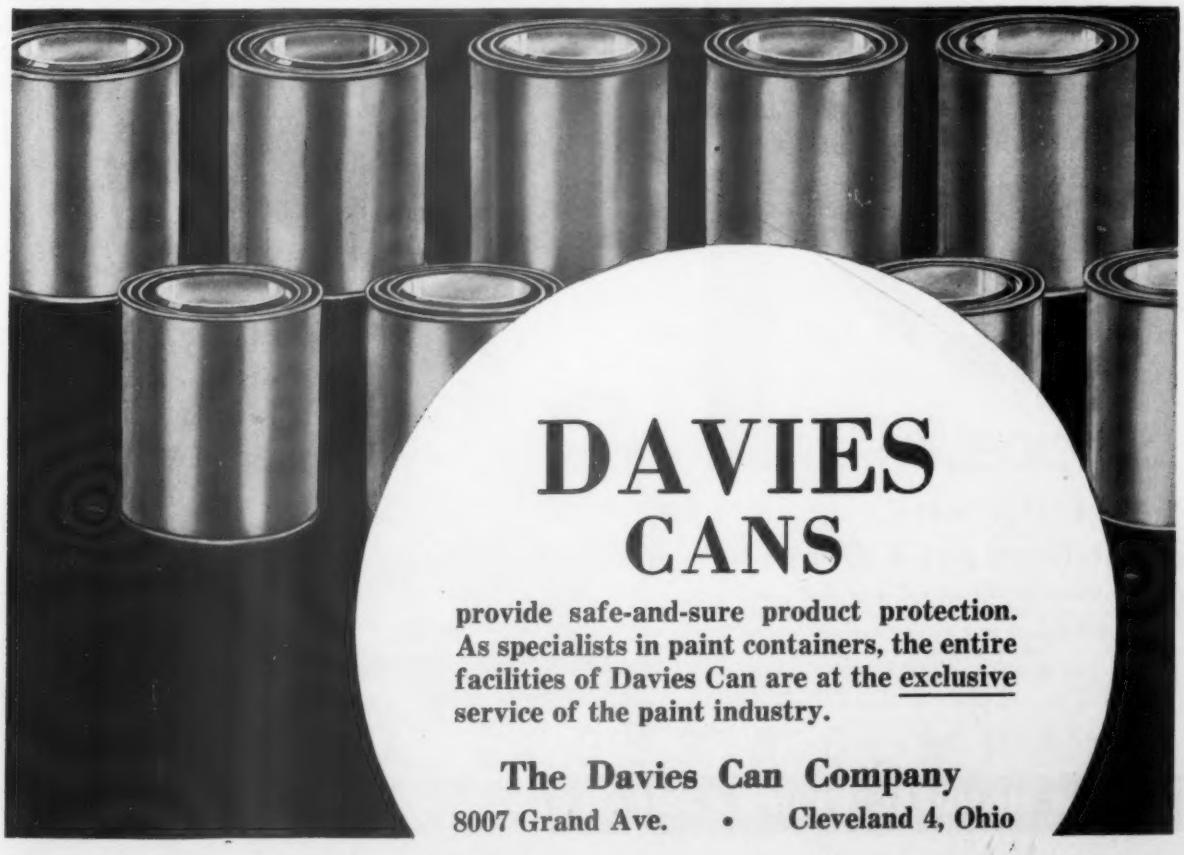
CLAUDE B. SCHNEIBLE COMPANY

P. O. Box 502, Roosevelt Annex • Detroit 32, Michigan

SCHNEIBLE

MANUFACTURERS • ENGINEERS • CONTRACTORS

A Schneible Multi-Wash Collector serving 5 open kettles at a varnish plant in Chicago.



DAVIES CANS

provide safe-and-sure product protection. As specialists in paint containers, the entire facilities of Davies Can are at the exclusive service of the paint industry.

The Davies Can Company

8007 Grand Ave. • Cleveland 4, Ohio

abstracts

Lacquering of Black-Plate Food Cans

Ketterl, H. Nehring, E. and Schroeder, G. Verpackungswirtschaft, 1950, III, S. 10, 16, 18.

Lack of tin in Central Europe — especially during the World Wars — increased the tendency toward the replacement of tin plating of food cans with protective lacquers. An intermediate step was to reduce the thickness of the tin plating considerably. Long years of research and practical experience of the Authors proved that the protection afforded by the thin tin films proved much less protective than high-grade protective lacquers on bonderized iron surfaces. The authors describe means and ways of testing these lacquers from a practical point of view, including taste of canned food, sterilization capacity, acid resistance, elasticity, heat resistance, etc. Acid resistant spraying lacquers on phenol condensate bases proved highly satisfactory against all fruit acids, even in cases where even high-grade tin plated material requires protective lacquering.

•

Graphite Paints

Hadert, H. Werkstoffe und Korrosion, 2 (1951), 172-173.

Of the various groups of pigment graphites, natural graphites of suitable composition, shape and pretreatment yield most satisfactory results as anti-rusting pigment. While the large-scaled types of graphite naturally yield maximum physical rust protection, economic reasons (in Germany) frequently require admixture with 30 to 50 percent of scaly graphite powder obtained from the residues of graphite crucible manufacture often containing up to 75 percent of sharp-edged quartz crystals reducing the paint-technological value of these mixtures. Much better results are obtained with powder graphite rich in carbon mixed with sufficient high grade powdered slate to attain a total carbon content of 40 or 50 percent. Mixtures of this type give perfect rust protection under most circumstances while for special purposes such as bridge and crane constructions extra-pure graphites (100% carbon) ground to a fineness of 0.005 mm (5 microns have been produced. Chemically disintegrated graphite (f. inst. German Patent 534 178-E. Faber) is claimed to offer a much higher degree of hiding power.

It is not true, in contrast to frequent opinions, that corrosion protection of graphite paints improves with increasing purity of the graphite. Pure graphite forms an electrolytic element in contact with a metal and in presence of an electrolyte, thus theoretically supporting corrosion. High corrosion protection is obtained with the so-called Silica-Graphite containing about 67.4% carbon, 24.4% silica, 12% alumina, 3.9% ferric oxide, 1.2% calcium oxide and 1.1% magnesia.

Under practical conditions of application the graphite particles never are in

CUT COSTS! Get high-speed, trouble-free production with

Elgin EARNS ITS WAY

MODEL 'H'

Paint Filler with Cover Dropper & Capper

The Elgin Model 'H' fills oil and water base paints, places covers, and seals all sizes of cans with double friction covers (½ gal. to 1 gal.) — *completely automatic.* Quick changeover and ease of cleaning are additional features which account for the popularity of the Model 'H' in both large and small plants.

Write Today for New Folder illustrating Elgin Equipment — Address Dept. VA

ELGIN MANUFACTURING COMPANY
200 BROOK STREET
ELGIN, ILLINOIS

Tests all the way up and down the line — and widespread plant usage — prove that Gross' Distilled Soya Fatty Acids meet and exceed the demands of alkyd resin producers for minimum color and chemical change under heat . . . that Gross' Soya Fatty Acids are unmatched as to quality and uniformity . . . that Gross' Soya Fatty Acids should have been in your process long ago.

Groco 28 — Soya Bean Fatty Acids

Titre	25-30° C
Color Gardner 1933	2-4
after heat-test to 500° F.	4-7
Unsaponifiable %	0.3-1.5
Saponification Value	198-202
Acid Value	197-201
Iodine Value (Wijs)	125-135

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contact with metallic bases, being surrounded completely by their paint vehicles. The same applies to most other paint films. Experiments have shown that if a linseed oil-white lead film is exposed to dilute nitric acid solution, even after weeks of exposure the solution does not contain a trace of lead.

Electrical resistance tests of paint films after long exposure to water are highly indicative of the behavior of the films under practical conditions. Bakelite-linseed oil films containing various pigments in correct proportions were placed into water for twenty hours, excess water removed and the electrical resistance of the films tested. They were:—

Graphite and amorphous natural graphite	more than 10.00 M
Red lead paint	4.10
Zinc chromate paint	3.60
Artificial graphite (almost pure carbon)	0.180

This proves the superior inertness of the graphite paints.

The specific weight of graphite is 2.2-2.6, that of red lead iron oxide about 5, of red lead about 8.7. One gallon of silicious graphite paints weights about 9-10 pounds, one gallon of red iron oxide 15-17 lbs and 1 gallon of red lead paint more than 25 pounds.

The scaly types of natural silicious graphite are specially impervious to actinic rays, their paint films are of an elastic rubbery consistency not sensitive to common bending stresses and to frictional stresses imposed by flying dust and sand particles. The oil absorption is very great and these graphites need not be ground into their vehicles but need merely be mixed together in modern mixing machines. Straight graphite paints exhibit comparatively long drying period which can be shortened by small additions of red lead or, more advantageously, by the addition of lead-manganese dryers while for heat resisting paints manganese dryers alone are used.

Simple graphite paints consists of 75 percent of graphite (40 or 50% C) and 25 percent of linseed oil. Light grays are obtained with zinc-white and titanium white. A medium grade of these paints contain 40 lbs. graphite (40 or 50% C) 40 lbs. Zinc-white or zinc-white heavy spar 1:1, and 40 lbs. linseed oil. A high-grade bright blue-gray graphite paint consists of 20 lbs. graphite, 18 lbs. white lead, 60 lbs. linseed oil, 2 lbs. siccative. There are numerous patents covering graphite paints outside of the USA such as Hungarian Pat. 113 367 (S. Gracza), British Pat. 447 064 (Berthoud, Borel & Co.), Italian Pat. 278 339 (I. G. Farben-Industrie), Canadian Pat. 362 500 (Rov), Belgian Pat. 415 952 (Pechin), Norwegian Pat. 56 633 (Bjornstedt), etc.

Film Adhesion on Aluminum

Schenk, M. Chemische Rundsch au, 3 (1950), 11

Based on comprehensive studies and experiments M. Schenk submits a number of requirements and suggestions regarding the scratching, rubbing, grinding, weathering and chemical resistances of varnish and lacquer films on aluminum. Since smooth, bright aluminum surfaces are little suited to most paint and varnish materials it is necessary either to produce absorbent oxide or salt films by the action of chemically oxidizing solutions or by anodic oxidation or to form extremely thin oxide skeletons on the aluminum surfaces.

The following types of lacquers and varnishes can be applied to aluminum surfaces thus prepared:—

Clear lacquers: nitrocellulose lacquers, mixed esterfied acetyl-butyl-cellulose lac-

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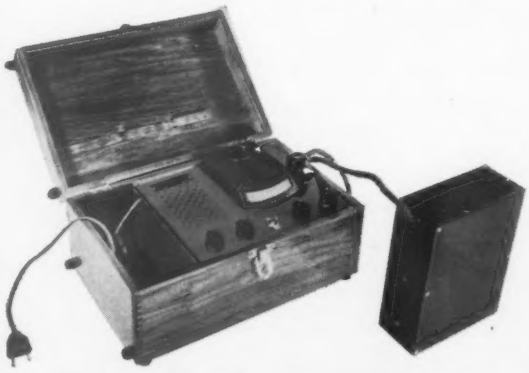

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AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: Protecting Aluminum with "ALODINE"®

INTRODUCTION

Aluminum not only corrodes when exposed unpainted to the atmosphere (particularly in moist, salt-laden air or industrial fumes) but also sheds paint unless the surface is actually changed prior to finishing. Simple treatments involving cleaning, or etching, or both, which heretofore have been used extensively, do not change the chemical composition of the surface and are inadequate. Far from retarding the corrosion of unpainted aluminum, such processes may in fact stimulate it.

In general, coatings integral with the aluminum itself have proved to be far more effective than cleaning and etching treatments for bonding paint and protecting the metal. "Alodine", which forms a stable, durable, non-metallic surface on aluminum, anchors the paint finish, prolongs paint life, and protects aluminum exposed unpainted in moist and salt-laden atmospheres.

CHARACTERISTICS OF THE "ALODINE" COATING	
TYPE	Non-metallic surface, integral with aluminum it protects.
COLOR	Depending on alloy treated, color range is from an iridescent blue-green to a dark slate grey.
THICKNESS	From 0.01 to 0.08 mil. No appreciable dimensional changes occur when aluminum is Alodized.
WEIGHT	50 to 300 mgs. per square foot. Optimum: 100 to 200 mgs. per square foot.
SOLUBILITY	Insoluble in water, alcohol, solvents, etc. Insoluble in most dilute acids and alkalis. However, strong acids and alkalis which attack aluminum may penetrate the "Alodine" film and react with the underlying metal. Slightly soluble in concentrated nitric acid. Soluble in molten sodium nitrate, etc.
ELECTRICAL RESISTANCE	High diaelectrical resistance.
HEAT STABILITY	Unimpaired at temperatures that melt aluminum.
FLEXIBILITY	Integral with and as flexible as the aluminum itself. Can withstand moderate draws.
ABRASION RESISTANCE	Approximately 90% of that provided by chromic acid anodized aluminum.
SALT SPRAY	Painted—superior to chromic acid anodizing. Unpainted—comparable with chromic acid anodizing.
PAINT-BONDING	Excellent. Equal to or superior to anodizing.
TOXICITY	Non-toxic.
BIMETALLIC CORROSION RESISTANCE	Shows good resistance against bimetallic or galvanic corrosion.

ALODIZING IS EASY AND EFFECTIVE

The Alodizing process is a chemical one and does not require electrolytic techniques or equipment. Alodizing is simple, foolproof, low in cost, and requires a minimum of equipment. Essentially, the process consists of the following easily controlled operations or steps:

1. Cleaning the work.
2. Rinsing the cleaned aluminum surfaces.
3. Coating with "Alodine."
4. Rinsing with clean water.
5. Rinsing with warm "Deoxylyte" (acidulated rinse).
6. Drying.

After treatments. Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" surface.

"ALODINE" MEETS SERVICE SPECIFICATIONS

"Alodine" applied by immersion or spray complies with the rigid performance requirements of both industrial and Government specifications. The following is a list of Service Specifications which "Alodine" meets at the present time.

MIL-C-5541 — U. S. Navord O.S. 675
MIL-S-5002 — 16E4 (SHIPS)
AN-F-20 — AN-C-170 (See MIL-C-5541)
U.S.A. 72-53 (See AN-F-20)

BRUSH "ALODINE" PROTECTS ALUMINUM IN THE FIELD, SHOP, OR HANGAR

Brush "Alodine" is easily applied in a simple brush-on or flow coat process to large assemblies and surfaces—airplanes, trucks, trailers, boats, housing, building siding, railway cars, bridges, etc.—that are too bulky or too remote to be conveniently treated in tanks or a multi-stage power spray washer. The cleaning and coating chemicals for Brush Alodizing are shipped in bulk or in the convenient Brush "Alodine" Chemical Kit No. 1. This Kit contains enough chemicals to treat about 1,000 square feet of surface and is an ideal package for use at airfields of commercial airlines or of the Armed Services anywhere.

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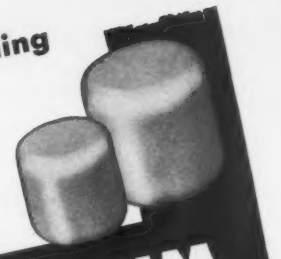

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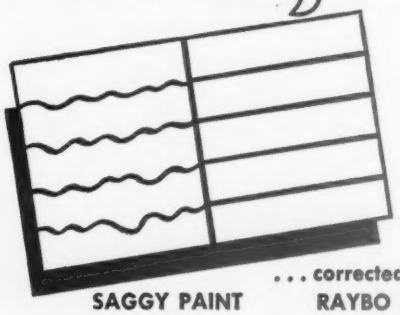

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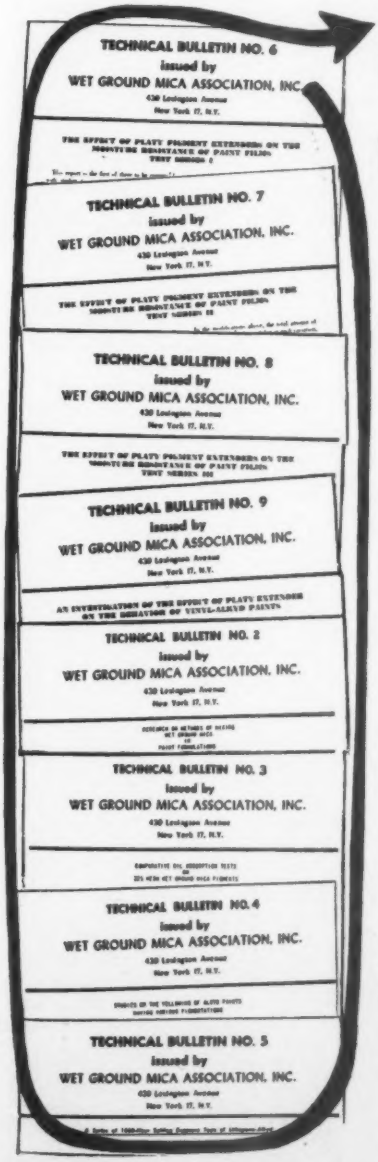
Air-drying enamels: oil varnishes, chlorinated rubber lacquers, vinyl mixed polymers, nitrocellulose and acetyl-butyl cellulose lacquers.

Baking enamels: phenol resin and alkyd resin varnishes, alkyd resin-carbamide-combination varnishes, melamine resin varnishes. Primers should contain inhibitors such as zinc or barium chromates in connection with lithopone, chromium oxide, red oxide of iron, talcum, microasbesto, etc. So called active pigments, including pigments containing copper, lead or mercury must never be used for this purpose.

Paints in Breweries

Theis, K. Brauwelt, 1950, 61-64.

In his first publication Theis reviews the oils and oil varnishes (on basis of linseed oil, wood oil and oil alkyd resin). The pigments (white lead, zinc white, aluminum powder and powdered iron mica), the chlorinated rubber lacquer paints (chlorinated rubber or cellulose derivatives, the rust protecting paints and wood preservatives. In his second publication he discusses the important spirit varnishes (shellac) useful in breweries and the results of his experiments on the resistance of fatty and oil-free paint materials against water, brines, heat and hot steam (superheated steam).



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Case Institute to Hold Finishes Symposium, February 27-29

"Recent Advances in Industrial Finishes" will be the topic of a symposium to be held under auspices of the Organic Research Laboratory of the Department of Chemistry and Chemical Engineering at Case Institute of Technology, Cleveland, Ohio, February 27-29. Planned as a short course in the fundamentals of paint as an engineering material, the symposium is designed for all concerned with problems of selection, specification and application of protective and decorative coatings as a mass production operation.

The core of the program will be the lectures by the specialists reviewing issues of particularly current interest in the industrial finishing of metal. The greater part of the symposium time, however, will be given to informal discussions open to all participants in the symposium.

The purpose of the symposium as explained by Dr. William von Fischer, head of the Department of Chemistry and Chemical Engineering, is not only to review progress in special aspects of the technology, but also to stimulate interest in the study of critical problems in which the lag in development has limited more extensive use of better coatings.

The detailed program follows:

Wednesday morning, Feb. 27, Synthetic Resin Finishes for Improved Corrosion Protection, W. von Fischer, Case Institute of Technology.

Wednesday afternoon, Feb. 27, New Aspects of Color Design, E. C. Botti, Pigments Department, E. I. duPont de-Nemours and Company, Newark, N. J.

Thursday morning, Feb. 28, Preparation of Metal Surfaces for Painting: Steel, R. C. Gibson, Parker Rust Proof Company, Detroit, Mich.; Aluminum, H. A. Barbian, The Dow Chemical Company, Midland, Mich.

Thursday afternoon, Feb. 28, Spray Application of Paint: The Factors Involving Economical Spray Application, L. W. Lammiman, The De Vilbiss Company, Toledo, Ohio; Electrostatic Spraying Process, D. E. Creps, Ransburg Electro-Coating Corporation, Indianapolis, Indiana; Today's Opportunities for Nitrocellulose Lacquer, R. L. Huber, Hercules Powder Company, Wilmington, Del.

Thursday evening, Feb. 28, Laboratory Testing for the Prediction of Service Properties of Coatings, Francis Scofield, National Paint, Varnish and Lacquer Association, Washington, D. C.

Friday afternoon, Feb. 29, Writing of Specifications for Coatings, E. G. Bobalek, Case Institute of Technology.

Reservations for the symposium are being received by Professor W. von Fischer, head of the Department of Chemistry and Chemical Engineering, Case Institute of Technology, Cleveland 6, Ohio. The registration fee is fixed at $35.

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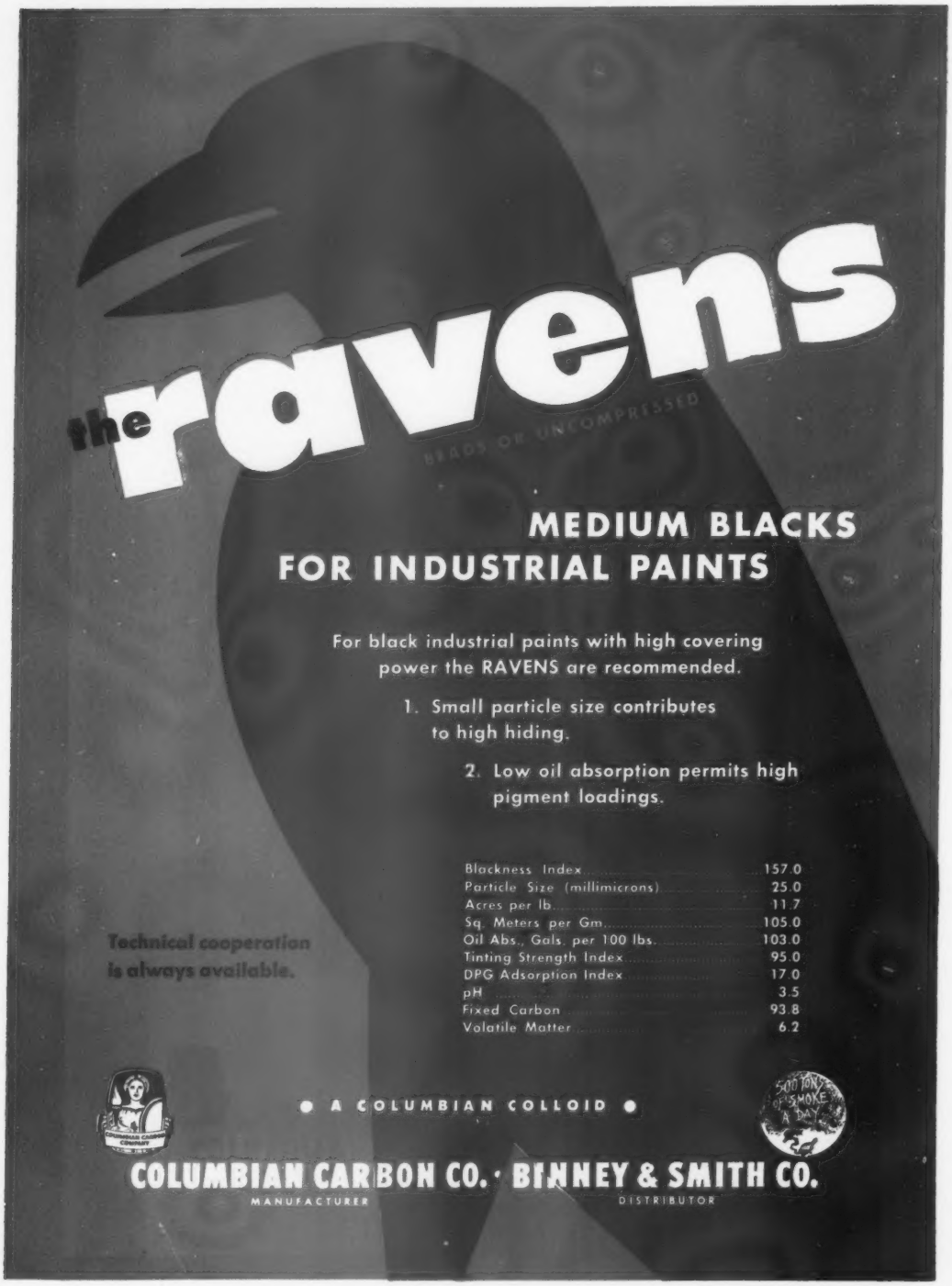
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